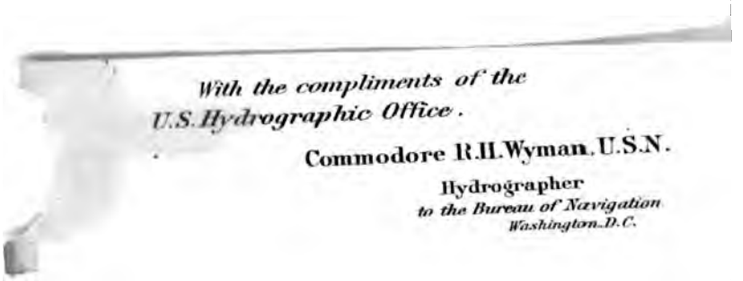
NO. 65

TELEGRAPHIC DETERMINATION OF LONGITUDE IN THE WEST INDIES AND CENTRAL AMERICA.


With the compliments of the
U.S. Hydrographic Office.
Commodore R.H. Wyman, U.S.N.
Hydrographer
to the Bureau of Navigation
Washington, D.C.

— Bureau of navigation —

U. S. HYDROGRAPHIC OFFICE.—No. 65.

REPORT

ON THE

TELEGRAPHIC DETERMINATION

OF

DIFFERENCES OF LONGITUDE

IN THE

WEST INDIES AND CENTRAL AMERICA.

BY

Francis
LIEUT. COMMANDER F. M. GREEN, U. S. N.

PREPARED AT THE U. S. HYDROGRAPHIC OFFICE

BY ORDER OF

COMMODORE R. H. WYMAN, U. S. N.,

HYDROGRAPHER.

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Washington D.C.

UNITED STATES HYDROGRAPHIC OFFICE,
Washington, D. C., March 19, 1877.

SIR: Inclosing herewith the report of Lieut. Commander F. M. Green, U. S. N., of the operations and results of the expedition under his command, for the determination of longitudes in the West India Islands and Central America, I have the honor to call the attention of the Department to the thorough manner in which this work has been performed; highly creditable to the officers connected with it and to the Navy.

Very respectfully, your obedient servant,

R. H. WYMAN,
Commodore U. S. N., and Hydrographer.

Forwarded and approved:

DANL. AMMEN,
Commodore U. S. N., and Chief of Bureau of Navigation.

Hon. R. W. THOMPSON,
Secretary of the Navy.

UNITED STATES HYDROGRAPHIC OFFICE,
Washington, D. C., February 23, 1877.

SIR: I have the honor to forward herewith the report of the operations and results of the expedition under my command for the telegraphic determination of the longitudes of the West Indies and Central America.

The instruments and general outfit are all in good order, and ready for immediate use in the field.

In submitting this report, I beg to call your attention to the ability and industry manifested by Miles Rock, esq., principal astronomical assistant, and by Lieuts. S. Belden and J. A. Norris, and Masters C. W. Bartlett and D. L. Wilson, U. S. N. These gentlemen have invariably carried out my instructions with care and intelligence, and have lost no opportunity of trying to insure the success of the undertaking.

I desire also to state that the arrangements made with the West India and Panama Telegraph Company and the Cuba Submarine Telegraph Company for the use of their lines have been carried out by the officials of those two companies in the most thorough and cordial manner. Wherever we went, we found that orders to the clerks in charge of the telegraphic stations had preceded us, directing them to promote the success of our work by every possible means. These directions were given by the general superintendent at St. Thomas, R. T. Brown, esq., who spared neither pains nor time to aid us in every way.

Very respectfully, your obedient servant,

FRANCIS M. GREEN,
Lieut. Commander U. S. N.

Commodore R. H. WYMAN, U. S. N.,
Hydrographer to the Bureau of Navigation.

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DETERMINATION OF SECONDARY MERIDIANS IN THE WEST INDIES AND CENTRAL AMERICA BY THE ELECTRIC TELEGRAPH.

INTRODUCTORY.

In the construction of charts and maps of the earth's surface, and in determining the errors of chronometers for purposes of navigation or surveying, the assignment of different longitudes to the same point by various authorities has constantly been a source of difficulty and embarrassment.

The determination of the latitude of any place depending simply on the zenith-distance of any heavenly body on the meridian, the declination of which is known, is far more easily arrived at, its principal uncertainty being due to errors of observation. The determination of an absolute longitude from the first meridian, or, in other words, the determination of the difference of time reckoned at the two meridians at the same absolute instant, is attended with much greater uncertainty, except where the establishment of telegraphic communication affords the means of exchanging through submarine cables or land wires comparisons of the time at the two stations.

In view of this uncertainty, it has been urged for many years past by geographers of all civilized nations that secondary meridians should be determined at convenient distances from the primary one of Greenwich or Paris, to which the longitudes of all neighboring places could be referred with much less labor and uncertainty than would attend the measurement of the longitude of each place from the primary meridian.

Many of the famous circumnavigators have attempted to make such measurements by transportation of chronometers, but the length of time required for voyages round the world before the advent of steam, and the consequent errors due to faulty running of chronometers, caused these determinations to differ very much in different voyages. The annoyance and trouble arising from such differences has been great, and, in 1866, a committee of the French *Bureau des Longitudes* was directed to prepare a plan for fixing a certain number of fundamental secondary meridians, separated by convenient distances, all round the world, and, in March, 1867, their report having been submitted to the Minister of Marine, its immediate execution was directed. A commission of eminent French naval officers was organized to superintend the preparation for this work and its performance, and five or six parties of skilful observers were, after several months of preliminary study and practice, dispatched with their instruments to various parts of the world to make observations of moon-culminations to determine the difference of longitude between their respective stations and the meridian of Paris. At that time, the present wide extension of submarine cables could not be foreseen, or the French commission would doubtless have deferred this work till the method of exchange of telegraphic time-signals, so much simpler and more accurate, could be made use of.

Stations were accordingly established and observations were made in North and South America, Africa, China, Japan, and India, as well as in the islands of the Pacific and Indian Oceans. No pains nor time were spared to obtain the best results, but the resulting longitudes do not seem to be entirely free from uncertainty.

Professor Asaph Hall, U. S. N., of the Naval Observatory, says:

"The trouble with moon-culminations is that there seem to exist, in the observations, constant errors which no amount of observing can get rid of. The real probable error of a longitude found by means of moon-culminations under the best conditions, that is, when the moon is compared with stars at both stations, amounts to two or three seconds of time. In case the position of the moon is taken from an ephemeris, the error in longitude may be much larger, since, at the present time, the ephemerides computed from the best tables, those of Hansen and Peirce, are frequently in error by nearly a whole second of time.

"It should be noticed that the moon's motion among the stars being nearly thirty times slower than the rotation of the earth on its axis, an error in the observations or in the position of the moon will appear in the resulting longitudes multiplied by a factor nearly equal to thirty."

By means of chronometers transported across the Atlantic in numbers, as well as by observations of moon-culminations, occultations, and eclipses, astronomers had sought to establish a secondary meridian at Washington by measuring the difference of longitude between it and Greenwich, the most accurate possible determination of this difference being required; but the discordance of the results which individually would have appeared entitled to full reliance exceeds four seconds of time, and it was not till the completion of the Atlantic cable in 1867 afforded an absolutely certain method that the question was finally settled. No amount of labor, effort, or expense was spared by the United States Coast Survey for its chronometric measurements, and the thorough accuracy of Professor Newcomb's investigations is well known to astronomers, yet the result of the latest chronometric expedition between England and the United States varies from the difference of longitude deduced by Professor Newcomb from moon-culminations observed at the Washington Observatory, and compared with corresponding observations at the Greenwich Observatory, by more than three and a half seconds of time.

It had long been known that the longitudes of various points in the West Indies and in Central and South America did not harmonize with each other, there having been no systematic attempt to determine them with relation to each other or to a common base. The longitudes in the western part of the Caribbean Sea depended upon the position of the Morro light-house, Havana, determined by Don José Joachim de Ferrer, from observed occultations between 1808 and 1812. Most of the received longitudes farther to the eastward, among the Virgin and Windward Islands, were measured by chronometer from Fort Christian, St. Thomas. This point was determined by difference of latitude and true bearing from the late Major Andrew Lang's observatory at St. Croix, the longitude of which depended on his numerous observations of moon-culminations and of occultations. The French officers who surveyed Martinique and Guadeloupe based their positions on longitudes derived

from moon-culminations, and it has been for years notorious that their longitudes and those of the neighboring English islands have not harmonized.

These considerations, and the completion of the lines of the West India and Panama Telegraph Company in the spring of 1873, caused Commodore R. H. Wyman, U. S. N., hydrographer to the Bureau of Navigation, to submit to the Navy Department a plan for the outfit of an expedition which should seek to determine with all possible accuracy the latitudes and longitudes of points connected by telegraph in the West Indies and Central America.

The lines of the West India and Panama Telegraph Company, with those of the Cuba Submarine Telegraph Company, afforded admirable facilities for longitude determinations. Extending from Guiana on the east, through the Windward and Virgin Islands, to Cuba and Jamaica, and thence to Aspinwall and Panama, and being connected, through Havana and Key West, with the telegraph system of the United States, trustworthy starting-points for the longitudes of the west coast of Mexico, Central America, and South America could be established, as well as for Brazil and the north coast of South America, while intermediate determinations could be made at as many of the West India Islands as might be desirable and convenient.

Authority for the work was at once granted by the Navy Department, and the preparation of the instruments and outfit was commenced at the Hydrographic Office. Upon addressing the authorities of the telegraph companies to ascertain the terms on which the use of the lines could be had for longitude determinations, the very liberal answer was made that no payment would be accepted for messages sent in relation to the work, or for the use of the cables after business hours; the only stipulation being that the clerks at the respective stations should be recompensed at a reasonable rate for their attendance and assistance in transmitting signals after the regular work of the day was over.

I cannot express too highly my appreciation of the courteous and efficient manner in which this arrangement was carried out by the officials of the West India and Panama and the Cuba Submarine Telegraph Companies.

Upon my return in the U. S. S. Fortune, in August, 1874, after completing the running survey of the Gulf coast of Mexico, I was directed by the Navy Department to prepare at once to carry out the work of determining latitudes and longitudes in the West Indies.

Fortunately for the success of the undertaking, the services of Mr. Miles Rock, a skilful astronomer and computer, formerly of the observatory at Cordova, were secured as principal astronomical assistant; and on the 24th of November, the instruments, observatories, and general outfit being embarked, the expedition sailed in the Fortune from Hampton Roads for Kingston, Jamaica, arriving on the 1st of December. At Kingston, permission was obtained of the agents to use the line of cable extending from Jamaica to Aspinwall, which had not at that time been accepted from the makers by the West India and Panama Telegraph Company.

On the 9th of December, the Fortune sailed for Aspinwall, arriving there after three days' passage. Upon obtaining permission, which was readily accorded, to land

and set up the instruments at Aspinwall and Panama, several days were occupied in making experiments to ascertain the best routine to be followed.

The general plan decided upon and strictly followed during the whole of the two years' work was that I should make all time-observations at one end of the line and Mr. Rock at the other; that one of the junior officers of the ship should be detailed as assistant and recorder with each observer; and that a trustworthy man from the crew should be attached to each observatory as attendant, the instruments and observatory never being left, day or night, without some one in charge.

The observatory and instruments to be used by the party at Panama having been sent there by railway, I accompanied Mr. Rock and his party to that place to select the observation-spot, and after my return to Aspinwall measurements of the difference of longitude between the two stations were made by exchanging time-signals on the evenings of December 23d and 24th, and January 4th and 5th. Latitude observations were also made by Mr. Rock at Panama.

On the 14th of January, the Fortune sailed for Kingston, Jamaica, leaving Mr. Rock, with Lieutenant Norris as his assistant, to occupy the Aspinwall station during the next measurement; Mr. Rock being directed to make observations for latitude, while the Fortune was on her way to Kingston, and to rejoin the ship by mail-steamer on the completion of the longitude measurement.

During our stay at Aspinwall, a most melancholy event took place—the sudden death of Master T. C. Spencer, an admirable young officer, whose high character and genial disposition had endeared him to every one. He had been Mr. Rock's assistant at Panama, and would have remained in the same capacity, which was now filled by Lieutenant Norris.

After a very rough passage, the ship arrived at Jamaica on January 20th, and the Aspinwall-Kingston measurement was made on the nights of January 25th, 26th, 28th, and 29th, Messrs. Rock and Norris, with the seaman left as observatory attendant, rejoining the ship at Kingston, with their instruments, February 9th. Again leaving Mr. Rock behind to occupy the Jamaica station, this time assisted by Ensign C. W. Bartlett, U. S. N., I sailed for Santiago de Cuba on February 14th, arriving there the next day. On account of the disturbed state of the island and the necessity of obtaining the necessary permission from the captain-general at Havana, a slight delay ensued; but on the nights of the 23d, 24th, 25th, and 28th of February, longitude-signals were satisfactorily exchanged with the party at Kingston.

Efficient assistance was received here from Lieutenant De la Pila, of the Spanish Navy, whom the captain-general had kindly detailed to aid us. Lieutenant De la Pila accompanied us to Havana, and was of very great service there also, facilitating our work in every way in the most courteous and friendly manner.

On the 4th of March, I went to Kingston with the Fortune, and transferred Mr. Rock and his party to Santiago de Cuba.

On account of the distance of the observatory from the town at this place, and the disturbed condition of the neighboring country, I considered it neither safe nor convenient to leave Mr. Rock's party here without the ship, and therefore decided to proceed to Havana with my party and instruments by mail-steamer, turning over the

command of the vessel temporarily to Lieutenant Belden, as my orders authorized me to do. Embarking in the steamer Gloria on March 10th, we arrived at Havana via Batabano on the 14th, and by the permission of Rear-Admiral Arias, commanding the Spanish naval forces, established the observatory in an excellent position in the yard of the arsenal, mounting the transit on the pier used by Captain Pujazon in 1868 for determining the longitude of Havana. By the kindness of Commodore Casariego, commandant of the arsenal, the rules were so modified that we were allowed to pass in and out at any hour of the night; and as my observatory attendant had been seized with yellow fever two days after our arrival, an efficient attendant was detailed from one of the Spanish ships at the arsenal.

On the 19th, 20th, 24th, and 25th of March, signals were successfully exchanged with Mr. Rock at Santiago, and on the 1st of April I was rejoined by the Fortune at Havana. Mr. Rock had observed stars for latitude at Kingston and Santiago, but no latitude observations were made at Havana, as the latitude of our station there had been carefully determined by Captain Pujazon.

I had fully intended to measure between Key West and Havana before returning home, but, owing to the prevalence of yellow fever at both places, the Secretary of the Navy directed me by telegraph to return at once. On the 5th of April, the Fortune sailed from Havana for Washington, arriving on the 12th of the same month.

Although the Fortune had met with no disaster, it had been clearly shown that she was too small to carry so large a party comfortably; and, for the completion of the work during the next winter, the Gettysburg, a large and commodious side-wheel steamer, was assigned.

A few changes which the experience of the first year had indicated were made in the outfit, but the same officers, and to a great extent the same men who were in the Fortune, were detailed for the Gettysburg, and on the 7th of November the Gettysburg left Norfolk for Key West, arriving on the 12th. At this station, the pier used by the United States Coast Survey for measuring the difference of longitude from Washington in 1873 was still in good condition, and was therefore used for mounting the transit.

After establishing Mr. Rock's party, the ship sailed for Havana, ninety miles distant, on the 16th, arriving there the next morning.

Every assistance was again rendered by Admiral Arias, Lieutenant Alfonso of the frigate Gerona being ordered to report to me for duty, and rendering every possible aid.

On the nights of November 26th, 27th, 28th, and 29th, time-signals were successfully exchanged between the observatories at Key West and Havana.

On the 2d of December, the Gettysburg proceeded to Key West, and after embarking the party left there with their instruments, sailed for Kingston, Jamaica, to carry the measurement from there to the eastward. On the passage, one of the crew was taken ill with remittent fever, and on arrival at Port Royal the ship was placed in quarantine till the exact nature of the disease should manifest itself. By the kindness of Commodore Lyons, R. N., commandant of the dockyard, and the other English officers at that station, this enforced seclusion was made as endurable as possible

by supplies of fresh provisions, ice, fruit, and newspapers, and in a few days the ship was allowed to proceed to Kingston.

Here Mr. Rock's party and instruments were landed, the station occupied by the observatory being precisely the same as during the last year's measurement to Aspinwall and Santiago de Cuba. On the 19th of December, the ship sailed for St. Thomas, stopping for a few hours *en route* at Cape Dame Marie and Nicola Mole in the island of Hayti, to make observations for chronometric determinations of their longitudes.

Off the west end of Hayti, the trade winds were found to blow so strongly and the sea was so heavy that there seemed to be danger that the supply of coal would not hold out, and I therefore ran into Santiago de Cuba to fill up with coal and wait for better weather. During the week of our detention there, it blew so heavily outside that vessels could neither leave nor enter the port, but on December 26th another start was made, and St. Thomas was reached on the 30th. Another interval of gales of wind and rain set in just after our arrival, breaking down the land line between Kingston and the eastern end of Jamaica, but on January 10th, 12th, 13th, and 14th, 1876, signals were successfully exchanged between Kingston and St. Thomas, and Mr. Rock and his party rejoined the ship at St. Thomas by mail-steamer on January 30. On the same day the ship sailed for Antigua, having left Mr. Rock and his party at St. Thomas to occupy that station, and arrived February 1.

On the nights of February 4th and 7th, time-signals were exchanged with St. Thomas, the ship departing for Guadeloupe and Trinidad on the 8th. Owing to the frequent breakages and faults in the submarine cables connecting the islands, it was impracticable to so connect the lengths joining the different islands as to exchange signals between them and St. Thomas.

As it was impossible to say how soon these breaks could be repaired, and as a cable extended directly from St. Thomas to Trinidad by way of St. Croix, I decided to go at once to Trinidad, and to measure back from there to such places as were found practicable after exchanging signals between St. Thomas and Trinidad.

Port Spain was reached on the 11th of February, and on the nights of the 15th, 16th, 17th, and 18th of that month time-signals were exchanged with the party left at St. Thomas, who were then directed to rejoin the ship at Trinidad by the first mail-steamer.

This was done on March 6th, and leaving Mr. Rock's party at Trinidad, the ship sailed for Barbados the next day, arriving at Bridgetown on March 8th.

Here the observatory was established as soon as practicable after receiving permission to do so, and on the nights of March 12th, 13th, and 14th, the difference of longitude between Port Spain and Bridgetown was measured.

On the 18th of March, the Gettysburg sailed for Martinique, arriving at Fort Royal March 20th after touching at Port Castries, St. Lucia. A few hours sufficed to obtain permission of Admiral de Kergrist, governor of the island, to make observations at St. Pierre, and the ship proceeded at once to that place. While entering the roadstead, a serious fracture was discovered in the frame of the engine, which detained the ship at St. Pierre till April 20th before repairs could be completed. On the 25th, 26th, and 29th of March, time-signals were exchanged with Trinidad to determine the

longitude of Martinique, and on April 11th Mr. Rock and his party arrived by mail-steamer to rejoin the ship. As soon as repairs to the engine could be completed the ship sailed for St. Croix, where she arrived April 26th, after calling at Roseau, Dominica, and Pointe á Pitre, Guadeloupe. At both of these places, chronometric observations were made for longitude.

As soon after arrival as possible, Mr. Rock's party were established at Christiansted, St. Croix, and I proceeded with the ship to St. Thomas, where the pier built in January had been left standing. On April 29th and May 2d, 3d, and 4th, signals were exchanged between my observatory at St. Thomas and Mr. Rock's at St. Croix, and we then exchanged stations, Mr. Rock with his instruments occupying the St. Thomas observatory and my party being transferred to St. Croix. This measurement was again made on four nights, May 9th, 11th, 12th, and 13th, for the purpose of determining our relative personal equation. The result was quite satisfactory, the mean of each four nights only differing by $0^s.05$.

As soon as this work was completed, I left Mr. Rock at St. Thomas, and proceeded on the 14th of May to San Juan, Puerto Rico, arriving the next day. Every assistance was rendered by the Spanish authorities to facilitate the work, Lieut. F. Guarro of the Spanish navy being especially detailed for that purpose, and on May 16th and 19th signals were exchanged with the party at St. Thomas, completing the astronomical work of the season.

On the 20th of May, the Gettysburg left San Juan, and, after embarking the party at St. Thomas, left that port for Bermuda on the 25th of the same month. A series of deep-sea soundings in the intervals between those made by H. M. S. Challenger was made during the voyage to Bermuda, and another line was run from Bermuda to Cape Henry, the ship arriving at the Washington navy yard June 14th, 1876. A detailed report of the soundings has already been made.

DESCRIPTION OF STATIONS.

1. Key West.
2. Havana.
3. Santiago de Cuba.
4. Kingston (Jamaica).
5. Aspinwall.
6. Panama.
7. San Juan (Puerto Rico).
8. St. Thomas.
9. St. Croix.
10. St. Johns (Antigua).
11. St. Pierre (Martinique).
12. Bridgetown (Barbados).
13. Port Spain (Trinidad).

KEY WEST.

The initial point of the measurement was the United States Coast Survey station at Key West for measuring the difference of longitude between that place and Washington, D. C., by the electric telegraph.

This difference was determined in December, 1873, and January, 1874, with the coöperation of the United States Naval Observatory, Sub-assistant Edwin Smith, of the United States Coast Survey, being the observer at Key West, the observations at Washington being made by Professors Harkness and Eastman, U. S. N., and Assistant E. Frisby.

The brick pier, on which Mr. Smith's transit instrument was mounted, was left standing, and was used by Mr. Rock for the same purpose. It was situated in front of the United States naval store-house, 24 feet north and 6 feet west of the Soldiers' Monument.

In Appendix No. 11 to the Coast Survey Report for 1875 is a detailed account of the measurement from Washington, resulting in the following position for the Key West station:

Latitude N., 24° 33′ 26″.5.
Longitude W., $5^h\ 27^m\ 13^s.64$,
Or, in arc, 81° 48′ 24″.66.

In establishing telegraphic communication between this station and Havana, the observatory was connected with the telegraph office by about 200 yards of insulated copper wire suspended from poles.

HAVANA.

The station at Havana was in the southeast part of the arsenal grounds, the transit pier being the one used by Captain Pujazon, of the Spanish navy, in the telegraphic measurement made from Washington in 1868. (See Appendix I to Washington Observations for 1870.)

This pier is situated 352 feet N. 67° 20′ W. (true) from the southeast angle of the wall surrounding the arsenal, and, according to a plan sent by Captain Pujazon to Prof. W. Harkness, U. S. N., lies 7,956 feet S. 8° 39′ E. from the Morro light-house.

The telegraphic communication between Havana and Key West consists of a submarine cable about 90 miles long, landed on the Key West side near the light-house, and on the Cuba side near the cove of Cojimar, a short distance east of the Morro Castle. From these two points overland lines connect with the respective stations. The telegraph station at Havana is in the palace of the captain-general, three-quarters of a mile from the arsenal; but by the kindness of Rear-Admiral Arias, commanding the Spanish naval forces, permission was obtained to make use of the telegraph wire connecting the office of the commandant of the arsenal with the captain-general's palace. An insulated wire, about 200 yards long, connected the observatory with the commandant's office, so that the Havana observatory was brought into telegraphic communication with the Key West and Santiago stations.

The latitude of the Havana station, as determined by Captain Pujazon from transits of stars over the prime vertical, is N. 23° 8′ 3″.04.

SANTIAGO DE CUBA.

The station at Santiago de Cuba was in rear of the Blanca battery, about half a mile to the southward of the city. The centre of the transit pier was 203 feet S. 39° E. (true) from the southern angle of the battery, and 150 yards from the hut where the telegraph cable is landed. The observatory and the cable hut were connected by a line of insulated copper wire suspended from poles, the end of the wire in the cable hut being connected to the cable every evening before exchanging time-signals, and disconnected after their completion. The telegraphic connection between this point and Havana consists of 470 miles of submarine cable extending along the south coast of Cuba, between Santiago and Batabanó, and a land line 27 miles long from Batabanó to the office in Havana.

No direct measurement between the observatory and prominent terrestrial objects was practicable, but by measuring on the best plan attainable of Santiago de Cuba, the Morro light-house appears to lie 19,367 feet S. 36° 40′ W. (true) from the centre of the observatory.

KINGSTON (JAMAICA).

The station at Kingston was 12 feet west of the centre of the pedestal on which the statue of Lord Rodney is mounted near the market-place.

Staff-Commander George Stanley, R. N., recently in charge of the survey of Jamaica, has kindly given me the true bearing and distance of Port Royal flagstaff, from the Rodney statue, as 20,204 feet S. 58° 20′ W. (true).

From the observatory, an insulated copper wire was extended to the telegraph office, where, as required, it was connected with the land line leading to Holland Bay at the eastern extremity of the island, or to that leading to Bull's Bay on the south coast. From Holland Bay, connected with Kingston by about 30 miles of land line, one cable is laid to Santiago de Cuba, 160 miles distant, and two stretch off to the eastward, one to Puerto Rico and one to St. Croix.

From Bull's Bay, joined to Kingston by a land line 8 miles long, a cable extends to Aspinwall (sometimes called Colon) in Central America, a distance of 550 miles.

ASPINWALL (COLON).

The observatory at Aspinwall was established on the green near the stone church, the centre of the pier being 756 feet N. 59° 30′ E. (true) from the centre of the light-house. The hut where the cable was landed is only a few yards from the light-house, and was joined by an insulated copper wire to the observatory. The only inconvenience of this situation was the great dampness caused by its proximity to the shore, on which a heavy surf was constantly beating. The telegraphic connection with Panama was by the land line, 47 miles long, extending along the Panama railway.

PANAMA.

At Panama, the observing-station was on the rampart of the northeast bastion of the fortifications, 103 feet N. 70° W. from the observation point occupied by Sir Edward Belcher in 1836. By a careful measurement made by Lieut. F. A. Miller, U. S. N., the southeast angle of the southern tower of the cathedral was found to be 988 feet S. 51° 10′ W. from the centre of the transit pier. Telegraphic communication with Aspinwall was made by a wire from the observatory to an office of the telegraph company about 200 yards distant.

SAN JUAN DE PUERTO RICO.

The site selected here for the observatory was on top of the western face of the city wall, which is here about twenty feet thick, of massive stone masonry. The center of the observatory was fifteen feet south of the northern extremity of this face of the wall and nearly over the San Juan gate. From a careful measurement made by Lieut. F. Guarro, of the Royal Spanish navy, the centre of the observatory pier was found to be 2428.2 feet S. 35° 56′ E. of the centre of the new light-house on the Morro Castle, the new light-house being 360 feet N. 27° 30′ E. of the old one. The hut where the cable from St. Thomas is landed is on the shore at the foot of the wall just below the observatory, so that the end of the cable was easily connected with the telegraph instruments in the observatory by a short insulated wire.

ST. THOMAS.

The observing station at St. Thomas was in the barrack-yard near the saluting-battery, the pier of the observatory being placed 126 feet true south of the southwest angle of Fort Christian. The mountains in the centre of the island rise to such a height that no stars of more than 79° north zenith distance could be observed, but to the southward the view was unobstructed. The submarine cables connecting St. Thomas with St. Croix on the south and with Puerto Rico and Jamaica on the west are landed about half a mile west of the town, short land lines connecting them with the office of the West India and Panama Telegraph Company. Telegraphic communication with the observatory here was obtained by running a line of wire about two hundred yards to this office.

ST. CROIX.

The observatory at St. Croix was placed on the common west of the fort, the pier being S. 22° 45′ W. 140 feet from the southwest bastion, and was connected telegraphically with St. Thomas by an insulated copper wire extending to the office of the West India and Panama Telegraph Company, a distance of about 200 yards. The land line from this office to the cable hut is one mile long, and the cable extending to St. Thomas is forty miles in length.

As the observatory of the late Major Andrew Lang was the point from which the longitudes of most of the Windward Islands have been measured, it was of importance to obtain its exact bearing and distance from the observatory pier. This was carefully done by measuring a base 2358.6 feet long, determining astronomically its direction, and observing the necessary angles with a theodolite, six measurements of each angle being made, three in each position of the telescope. This triangulation places the centre of our observatory pier N. 66° 10′ 34″ W. 6220.7 feet from the centre of the transit pier of Major Lang's observatory.

The instruments of this observatory are all dismounted, and the buildings are in ruins.

ST. JOHN'S, ANTIGUA.

The observatory was placed near the water's edge, in a vacant lot about 300 yards to the southeastward of the landing-place for boats. This vacant lot formed the yard of an old building known as the "Old Fibre Mill". From the observatory, the north tower of the cathedral bore N. 37° E., distant 1,643 feet, and by the Admiralty chart No. 2065, Fort James flagstaff bore from the observatory N. 59° 31′ W., distant 1.238 miles.

Telegraphic communication with the observatory at St. Thomas was completed by stretching an insulated copper wire from the observatory to the telegraph office, a distance of about 300 yards. Here it was joined to a land line about two miles long, connecting at the cable hut with the submarine cable to St. Thomas, 200 miles long.

ST. PIERRE (MARTINIQUE).

The observing-station at St. Pierre was in the St. Marthe battery, on a bluff south of the town, and 0.55 miles from the telegraph office. This battery is the position to which the longitudes of this part of the island have been referred by the French surveyors, the exact point of reference being the upper one of two masts on which lights are hoisted at night.

This mast was exactly south of the observatory pier, 35 feet distant.

A wire was stretched from the observatory to the telegraph office in the town, on the poles of the telegraph line from St. Pierre to Fort de France.

From Martinique to Trinidad, the telegraphic communication is formed by submarine cable, 260 miles long, by way of St. Lucia, St. Vincent, and Grenada. The faulty condition of the cable between Martinique and St. Thomas prevented my measuring directly between these two islands, as I intended to do.

BRIDGETOWN, BARBADOS.

The site selected here for the observatory was in Rickett's battery, in the northern part of the town, and about 400 yards from the telegraph office, the situation of which made it inconvenient to stretch wires to Beckwith battery, previously used as an observation spot.

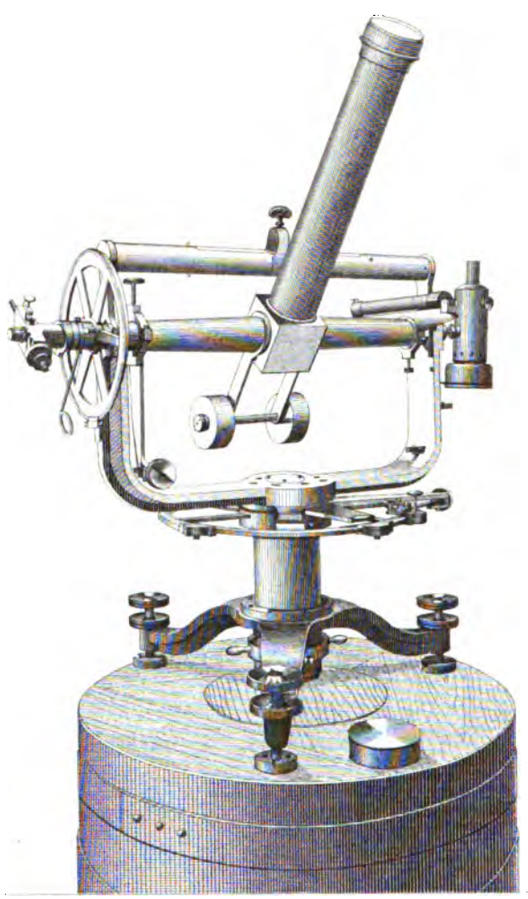
The centre of the pier was placed S. 67° 18′ E. 70.6 feet from the flagstaff, at the northwest angle of the battery, and by measurement on the large chart of Carlisle Bay, published by the United States Hydrographic Office, was 6,822 feet N. 26° 10′ W. from the observation spot in Beckwith battery.

The cable connecting Barbados with Trinidad by way of St. Vincent is 260 miles long, with seven miles of land line in Trinidad.

PORT SPAIN (TRINIDAD.)

The observatory at Fort Spain was placed very near the old fortification known as the "water battery", in one of the buildings of which is the telegraph office. From the centre of the transit pier, the flagstaff in the centre of the battery bore N. 81° 7′ E., distant 148 feet, and the centre of the light-house S. 58° 28′ E., 311 feet distant.

Port Spain is connected by a land line, seven miles long, with the cable hut at Macaripe Cove, on the north side of the island, where two telegraph cables are landed, one extending directly to St. Croix and the other to Grenada, where it connects with the cable joining the Windward Islands.



PORTABLE TRANSIT INSTRUMENT
AND
ZENITH TELESCOPE

U. S. HYDROGRAPHIC OFFICE - 1874

DESCRIPTION OF INSTRUMENTS.

1. Transits.
2. Chronometers.
3. Chronographs.
4. Batteries.
5. Telegraph instruments.
6. Observatories.

TRANSIT INSTRUMENTS.

For the determination of time and latitude, a combination of the transit instrument and zenith telescope was designed in the spring of 1873 by Mr. J. A. Rogers, who superintended the construction at the repair-shop of the Hydrographic Office of two of these instruments, precisely alike in every particular. (See plate.) They are of thirty inches focal length, with object-glasses of two and a half inches clear aperture, and are so constructed that the eye-piece is at one end of the horizontal axis, a prism at the junction of the telescope tube and axis reflecting at a right angle the rays from the object-glass, thereby enabling the observer to direct the instrument upon stars of any altitude above the horizon without changing his position. The tripod and vertical cylinder above it are of cast iron; the rest of the metal is bronze. The transverse arms which support the ends of the telescope axis are firmly screwed to the top of a vertical and slightly conical axis, which revolves in the cylinder surmounting the tripod. A small universal level over the head of this axis is of use in leveling the instrument approximately. The horizontal circle is fourteen inches in diameter, has two verniers, and reads to 10″. It is furnished with a clamp and tangent-screw for slow azimuthal motion, and with two sliding stops, which, when fastened at the proper points on the circle, enable the telescope to be turned exactly 180° in azimuth for zenith-telescope observations for latitude. A powerful clamp at the lower end of the vertical axis fixes it firmly in its seat when the instrument is adjusted in the meridian or prime vertical. By means of the horizontal circle, the instrument can be readily turned 90° from the meridian into the prime vertical, a feature of great importance when, from absence of a list to select proper stars from, or from any other cause, the zenith-telescope method of determining latitude is not available. The horizontal axis has a vertical finding circle eight inches in diameter, reading to minutes, and on the opposite end of the axis is a transverse level for indicating any change in inclination of the telescope from the vertical. This level, with a filar micrometer, of the usual form, attached to the eye-piece, forms the zenith-telescope attachment for the determination of latitude.

The eye-pieces are of the Ramsden pattern, magnifying about fifty and eighty diameters respectively. In practice, the less powerful one was used.

The eye-piece has a parallactic motion across the field, so that stars may be observed accurately over each of the seventeen transit-lines, if desired.

The bearings of the Ys which support the axis are segmental in shape, and have no micrometric attachment for either level or azimuthal adjustment.

A small spot $0^{in}.2$ in diameter, ground on the reflecting face of the prism, permits the transmission of rays of light from the lamp at the end of the axis to illuminate the threads in the eye-piece. These threads were eleven in number during the first year's work, with three transverse micrometer-threads; but much annoyance arising from their breakage, the transit-threads were replaced in the summer of 1875 by glass diaphragms, on which lines for transit observations were ruled with exquisite accuracy by W. A. Rogers, esq., of Harvard Observatory. In addition to these transit-lines, diagonal lines were ruled across the glass plate at equal distances to use instead of the micrometer for determining differences of zenith distances of stars should the micrometer-threads be broken.

The end of the tube which carries the micrometer-box fits accurately against a movable collar on the axis in such a way that when the instrument is adjusted to stellar focus the collar can be screwed up against this shoulder, preventing this adjustment from disturbance.

Hanging levels were constructed for the horizontal axis, but were not satisfactory, and were replaced by striding levels of the usual form, having divisions on the glass tube, about one millimeter apart, equal to $0''.94$ of arc or $0^s.063$ of time.

Each of these instruments is packed compactly in two boxes, and, as when mounted the instruments only weigh one hundred and twenty-five pounds each, they are easily transported.

The discussion of the observations has indicated that reversal of the axis is almost always attended with a slight change of azimuth, and that flexure of the horizontal axis must also be taken into account. As will be seen hereafter, the error arising from change of azimuth in reversing has been guarded against, and the flexure of the axis has been carefully determined, its effects being eliminated in reducing the observations.

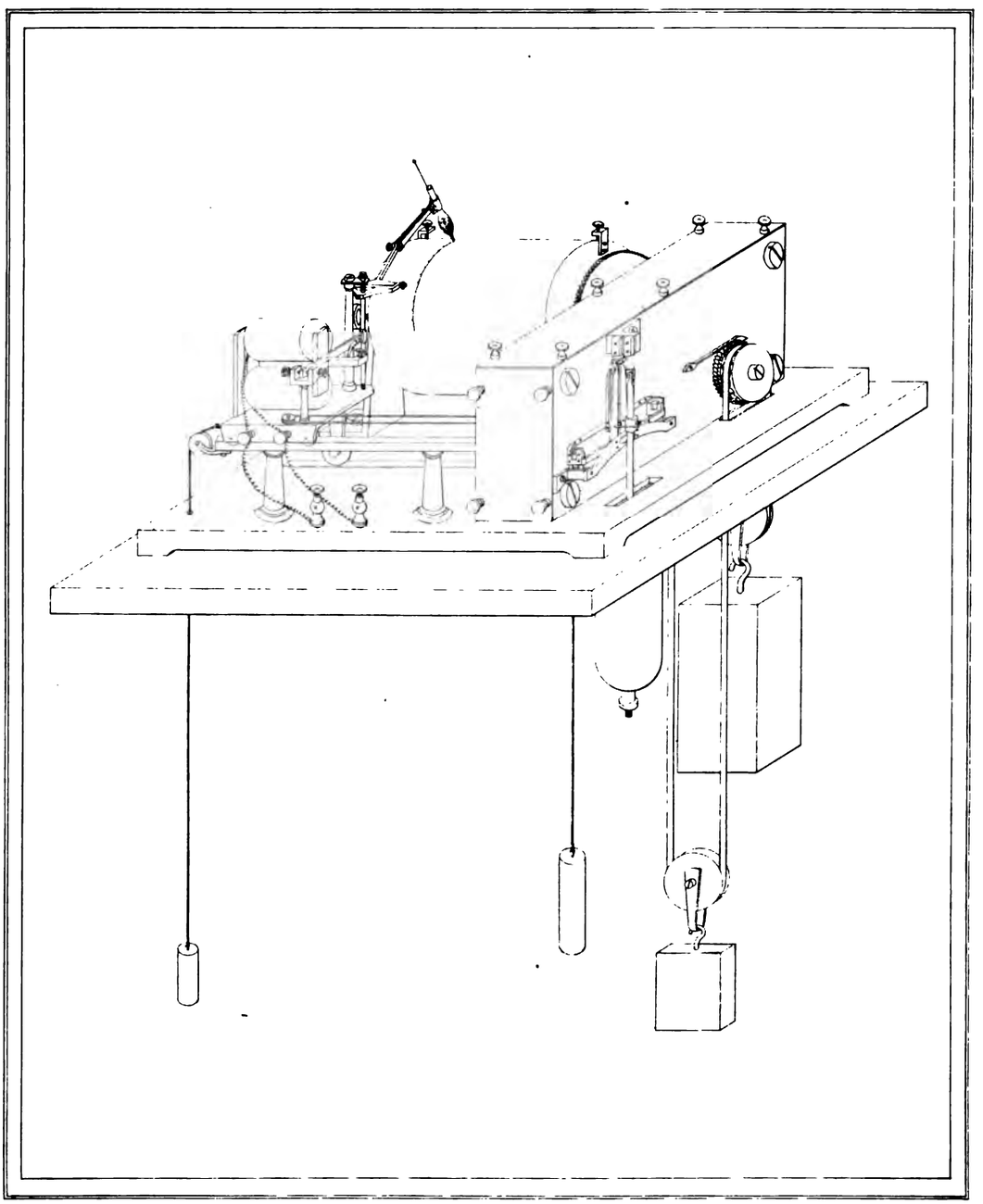
Flexure of the horizontal axis is probably unavoidable in this class of instrument. In the much heavier instruments, of a somewhat similar pattern, constructed for the Transit of Venus Commission, this feature was very decidedly manifested. The pivots of the horizontal axis have been carefully examined both by reversals of a level and by an ingenious application of the spherometer invented by Prof. W. Harkness, U. S. N., and have been found to be practically equal and regular.

In use, these telescopes were exceedingly convenient for both latitude and time observations, stars of the sixth magnitude being easily observed with them.

CHRONOMETERS.

Four break-circuit sidereal chronometers were furnished to the expedition, made by Messrs. T. S. and J. D. Negus, of New York. One of these chronometers for use and one spare one in case of accident were furnished to each party.

In these instruments, the wheel-work is made to break an electric circuit at the end of each second, (except that one which completes the even minute), by means of a toothed wheel acting on a jewel pallet attached to a light steel spring. In this steel spring is a platinum screw, which, when the circuit is complete, touches the point of another platinum screw connecting through a fixed insulated stud with one of the terminals on the outside of the chronometer. The spring on which the toothed wheel acts is connected with the other terminal. The electric circuit is complete



BOND'S PORTABLE CHRONOGRAPH

U. S. HYDROGRAPHIC OFFICE. 1875.

through the chronometer, except when the teeth of the wheel acting on the jewel pallet separate the platinum points. The circuit is opened for about one-fortieth of a second and is closed during the remaining thirty nine-fortieths.

One tooth in the break-circuit wheel is omitted in order to show on the chronograph the commencement of each minute.

The rates of the chronometers do not seem to be affected in breaking circuit, or by the passage of the galvanic current. These admirable instruments in every way answered the desired purpose.

CHRONOGRAPHS.

The registering of the times of transit of stars or of the occurrence of time-signals was performed by electric chronographs. During the first year's work, ordinary registers of the Morse pattern were used, having a fillet of paper passing between two rollers and indented by a stylet, except when the circuit was broken either by the action of the chronometer or by that of the key in the hands of the observer. These were found inconvenient in use, and for the second season's work two cylinder chronographs were ordered from Messrs. Wm. Bond and Son, of Boston. In these instruments (see plate), a train of wheel-work driven by a weight causes a cylinder about six and a half inches in diameter and seven inches long, and covered with a sheet of paper easily put on and taken off, to make exactly one revolution in a minute.

A little carriage, to which a pen of peculiar construction is attached, moves upon wheels along the cylinder in the direction of its length about one-tenth of an inch for each revolution of the cylinder, so that the pen records a perpetual spiral. The pen is so mounted as to have a slight lateral movement, and is so attached to an electro-magnet that when the electric circuit in which it is placed is broken every second by the chronometer, which, with a small battery, is included in the same circuit, the mark made on the chronograph paper, instead of being a straight line, will be broken at regular intervals.

By means of a break-circuit key in the hands of the observer, and included in the same circuit, the electric current may be interrupted, causing the pen to make a similar mark on the occurrence of any event, such as the passage of a star across any of the wires of the telescope.

When the sheet on the cylinder becomes full, it is taken off, and by means of a finely divided scale, the positions of these arbitrary marks, with reference to the nearest second-marks, may be accurately and easily determined. A screw at the bottom of the pendulum affords an easy method of regulating the clock-work, either for faulty running or for change of latitude.

For a description of the peculiar spring-governor escapement of these chronographs, see Brünnow's Astronomical Notices, page 164, and volume 1, Annals of Cambridge Observatory. These instruments were very portable, were easily set up and adjusted, and gave entire satisfaction in every particular.

BATTERIES AND TELEGRAPH INSTRUMENTS.

The batteries used during the first season were formed by plates of carbon and zinc partially immersed in dilute sulphuric acid contained in glass jars. This arrangement was not satisfactory, as the battery was very variable in strength, and the second season each party was supplied with a twelve-cell Le Clanché battery, two cells of which were used for the chronograph, and as many of the remaining cells as were necessary were used to establish communication through the cables between the observatories. This battery gave no trouble, and was ample in strength.

The telegraph instruments used during the first season were borrowed from the West India Telegraph Company; but for the next year's work two sets of reflecting galvanometers, keys, and lamps were procured from Messrs. Elliott Brothers, of London.

Upon overland lines, the time-signals received can be recorded automatically by connecting the chronograph with the telegraphic circuit by means of a relay magnet and a small local battery; but with submarine cables the electric impulse transmitted is not usually strong enough to act upon the electro-magnets of the relay.

For telegraphing with weak impulses over submarine lines, a very beautiful device was invented by Sir William Thomson, and is now in general use.

To a delicately suspended magnet surrounded by one or more coils of fine insulated wire a small mirror is attached. From this mirror, a beam of light from a lamp is reflected on a scale in a dark room, so that when no currents are passing through the cable, the beam remains at rest, but when at the sending station either of two keys is pressed, a positive or negative current, as the case may be, is sent through the cable and through the coil surrounding the magnet, causing the mirror to turn on its vertical axis, and to deflect the ray of light to the right or left.

When the signal arrives and is perceived, the observer touches his chronograph key, thus recording the time of its arrival.

OBSERVATORIES.

Portable wooden observatories, about eight feet square, were also designed by Mr. J. A. Rogers for sheltering the instruments and observers, and were constructed at the Washington navy-yard.

They were ingeniously made, so as to be easily and quickly set up and taken down, and were each furnished with a hood of painted canvas to draw over the roof in rainy weather.

DETERMINATION OF INSTRUMENTAL CONSTANTS.

The value of a division of the striding levels and of the transverse zenith-telescope levels was determined by applying the levels to the telescope of the mural circle at the Naval Observatory, and noticing the change in reading of the levels consequent upon slight movements of the telescope on its horizontal axis carefully measured by

the microscopes of the circle. Thirty of these observations for each level gave for the striding levels the following values:

Transit No. 1, 1 division $= 0''.94 \pm 0''.004$

Transit No. 2, 1 division $= 0''.94 \pm 0''.003$

and for the zenith telescope levels—

Transit No. 1, 1 division $= 1''.000$

Transit No. 2, 1 division $= 1''.006$

The equatorial intervals of the transit-threads were determined by repeated observations of complete transits of circumpolar stars. From these observations, the following values were deduced:

Season of 1874–75.

Transit No. 1.		Transit No. 2.	
	s.		s.
I	−54.60	I	−55.03
II	36.52	II	36.89
III	17.92	III	19.18
IV	8.93	IV	9.35
V	4.35	V	4.90
VI	− 0.13	VI	− 0.44
VII	+ 4.48	VII	+ 4.31
VIII	9.40	VIII	9.17
IX	17.67	IX	19.19
X	36.03	X	37.22
XI	+54.87	XI	+55.91

These values are for circle east. The values for No. 1 transit are derived from thirty-two transits, and for No. 2 from fifty-one transits.

Season of 1875–76.

Transit No. 1.		Transit No. 2.	
	s.		s.
A^1	−51.804	A^1	−52.419
A^2	47.774	A^2	48.412
A^3	43.815	A^3	44.413
B^1	27.833	B^1	28.266
B^2	23.856	B^2	24.242
B^3	19.889	B^3	20.177
C^1	7.928	C^1	8.083
C^2	− 3.934	C^2	4.016
C^3	+ 0.009	C^3	− 0.010
C^4	3.946	C^4	+ 3.993
C^5	7.951	C^5	8.046
D^1	19.876	D^1	20.197
D^2	23.856	D^2	24.204
D^3	27.844	D^3	28.229
E^1	43.735	E^1	44.396
E^2	47.700	E^2	48.458
E^3	+51.656	E^3	+52.515

The values for transit No. 1 depend on thirty-six complete transits, and for No. 2 on eighty transits. The values are for circle east. The lines from B^2 to D^2 inclusive are the only ones used for time-star transits, the outside lines being used to reverse upon and to adjust the instrument in the meridian.

In making a preliminary reduction of some of the first observations of time-stars, it was found that after reducing the error of collimation to a minimum by repeated observations and adjustments by means of a horizontal collimator, the clock corrections deduced from stars observed with the circle end of the axis east, differed from those resulting from observations made with the axis in a reversed position by an amount varying from one second to one second and two-tenths. I was at first unwilling to attribute so large a difference to flexure of the horizontal axis, but on making careful observations with a view to determine the exact degree of flexure (which must of course be present in all instruments of this pattern), it was found that the correction to be applied was for an equatorial star in the zenith 8″.25 or 0ˢ.55 for No. 1 transit, and 8″.10 or 0ˢ.54 for No. 2 transit, values which accounted for the observed discrepancy in the results. These values were determined by observing a large number of stars on the meridian at various distances north and south of the zenith, in both positions of the instrument, and deducing the chronometer correction for each, corrected for the level, collimation, and azimuth errors of the instrument. The difference between each chronometer correction, as thus obtained from a star, and the true chronometer correction obtained by comparing the chronometer with the standard clock of the United States Naval Observatory was assumed, after reducing to the equator, by dividing by the secant of the star's declination, to be due to the flexure at the zenith distance of that star, expressed in seconds of time.

On obtaining the ratio of the flexure corrections at the several zenith distances, by dividing each one by the value at the zenith, they were found to follow almost exactly the law of the cosine of the zenith distance, having a maximum value when the telescope was pointed to the zenith, and a zero value when it was horizontal.

For transit No. 1, the zenith value was found to be,

$$f = 0^s.55$$

and for transit No. 2

$$f = 0^s.54.$$

Hence the flexure correction for any star is,

$$\text{No. 1, for circle } \left\{ \begin{matrix} \text{east} + \\ \text{west} - \end{matrix} \right\} \; 0^s.55 \cos z \cos \delta$$

$$\text{No. 2, for circle } \left\{ \begin{matrix} \text{east} + \\ \text{west} - \end{matrix} \right\} \; 0^s.54 \cos z \cos \delta$$

The values of a revolution of the micrometer screws were determined by numerous observations of circumpolar stars at elongation, as well as by measuring with the micrometer the intervals between equidistant diagonal lines ruled on the glass diaphragm, the exact angular distance between these lines being ascertained from numerous transits of stars over them.

From all these observations, the following values have been deduced:

Transit No. 1, 1 revolution = 65″.80

Transit No. 2, 1 revolution = 66″.83

In latitude observations, the micrometer reading needs a correction for flexure of the axis $\pm (f \sin z)$ according to the position of the axis, but always having the same sign for both stars of a pair, and rarely exceeding 0″.05 as a correction to the latitude.

METHODS OF OBSERVATION.

In selecting sites for the observatories, it was necessary to bear in mind the following desirable conditions, viz: a firm foundation; an unobstructed north and south view; facility of measurement to some permanent and easily distinguished landmark, to which the latitude and longitude could be referred; proximity to the telegraph office, so that too much wire should not be required to connect with the observatory; and seclusion from crowds of inquisitive idlers. Thanks to the cordial and zealous assistance everywhere extended, these requisites were found much more easy of attainment than had been expected.

A surveyor's compass was used to determine an approximate meridian-line, for use in setting up the observatory and pier.

Portable piers for mounting the transit instruments, made in the form of the frustum of a cone, of heavy oak staves, hooped strongly with iron, and to be filled with earth when in use, were furnished, and were used during the first season. It was, however, found expedient to build brick piers, as their superior stability was found to warrant the trouble and delay attending their erection.

In building the piers, Portland cement was used, and two or three days having been allowed for it to harden, the transit instrument, chronograph, and telegraph instruments were set up and carefully adjusted.

During the first ensuing clear evening, the transit was placed accurately in the meridian by repeated observations of zenith and circumpolar stars. The telegraph instruments being connected in each place with the telegraph office, or with the telegraph cable at its landing hut, so that telegraphic communication was established between the observatories, and everything being in readiness, the routine was as follows:

About 6 o'clock p. m., messages were exchanged as to clearness of sky, and if clear at both places, work was commenced about 8 o'clock by observing the transits of six or eight Nautical Almanac time-stars, if possible, between the equator and the zenith, and two or three circumpolar stars. At a time previously designated, generally from half past 9 to 10 p. m., one end of the wire from the observatory was connected at the telegraph office with the main line; the other end, after including the telegraph instruments in the circuit, being put to earth, care being taken to have the earth-plates at both observatories of the same material, as trouble was experienced in sending signals when one was of copper and the other of iron.

One of the telegraph clerks then came to the observatory at each place to assist in sending messages; and communication being established, the chronometers at the two stations were compared in the following manner:

At ten seconds before the completion of a minute by his chronometer, the senior observer sent a rattle, or preparatory signal, by tapping his key several times in quick succession; then exactly at the even minute pressing his key again for about a quar-

ter of a second, and repeating this signal at intervals of five seconds, till the completion of the next even minute.

The hour and minute when the first signal was sent were then telegraphed to the receiving station, and repeated to insure correctness.

The time of arrival of these signals, marked by the deflection of the ray of light from the galvanometer, was recorded by the chronograph at the receiving station, and five similar sets were sent from each observatory to the other, making sixty-five signals sent and received by each observer.

After these exchanges of signals, five or six more time-stars and two or three circumpolars were observed, completing the night's work, unless, as happened once or twice, it was thought best to observe pairs of stars for latitude on the same night.

The position of the axis of the transit instrument was reversed at least once every night, to facilitate the elimination of the error of collimation, and the level was applied and read after each star.

On the completion of the night's work, the telescope was removed from the Ys and deposited in its box, to guard against accident. Although this involved an almost certain change of azimuth between the nights, it was regarded as most prudent.

In exchanging time-signals, positive currents were invariably used to guard against any possible difference of velocity as compared with negative currents. This course had the additional advantage that one sending-key was constantly used, and the deflection of the ray of light at the receiving station took place always in the same direction.

In selecting stars for time observations, only those were used whose right ascensions are positively and accurately determined, the chronometer correction always depending on stars of the American Nautical Almanac or of the Berlin Star List.

Generally speaking, observations for both longitude and latitude were not made on the same evening, but there was no difficulty in so doing, if desirable. In preparing to observe for latitude, pairs of stars, generally not more than twenty degrees from the zenith and not differing in zenith distance when on the meridian more than ten minutes of arc, were selected from the British Association Catalogue. It was found desirable that the stars of a pair should not be less than one and not more than fifteen minutes of right ascension apart.

The telescope being in the meridian, and the observing list prepared, one of the movable stops on the circle was moved up against one side of the tangent-clamp, and there fixed by its own screw. The clamps were then loosened, and the instrument was turned exactly 180° on its vertical axis. This was done either by turning off an angle of 180° by the horizontal circle, or by observing a circumpolar star on the middle transit thread at culmination. When the telescope was adjusted in its new position, the other stop was fixed against the other side of the tangent-clamp. It could then be turned exactly 180° in azimuth, bringing up against the stops when in the meridian line.

Being set at the mean zenith distance of the first pair of stars, the bubble of the transverse level was brought to the middle of its tube, and as soon as the first star of the pair arrived on the middle transit-thread, it was bisected by the middle micrometer-thread, and the time by chronometer noted by the assistant, who also recorded the

micrometer and level reading. The telescope was then turned in azimuth 180°, the tangent-clamp bringing up against its stop. On the appearance of the second star, it was bisected on the middle transit-thread by the same micrometer-wire, and the time, micrometer, and level again read and recorded. This proceeding was repeated for each pair of stars, from twelve to fifteen pairs being generally observed. From two to four evenings were usually devoted to latitude work, the observations being mostly made by Mr. Rock, while my party with the ship were proceeding toward another station.

REDUCTION OF OBSERVATIONS.

CHRONOMETER CORRECTIONS.

The reduction of the time observations has been performed by Messrs. J. A. Rogers and Mr. Rock, assisted by Lieut. J. A. Norris, U. S. N.

Mr. Rock has computed his own observations and Mr. Rogers has reduced those made by me, the system followed by both computers being essentially the same.

After applying to the mean of the recorded times of transit of each star over the wires the corrections for missed wires, flexure of the axis, level, and diurnal aberration, equations of condition were formed for each star, from the solution of which were derived the instrumental constants for azimuth and collimation.

As it was found that a reversal of the axis almost always caused a change in the azimuth of the instrument, these equations of condition were divided into two or more groups, each involving a separate value of the azimuth constant.

Where the instrument was reversed once only, two values of azimuth were involved; but where it was reversed more than once in an evening, a new azimuth value was deduced and substituted after each reversal. After deducing, by the method of least squares from all the stars observed, the azimuth and collimation constants, the determination of the chronometer correction at the given time, and its rate, was begun by applying to the mean of the recorded times of transit of each clock-star over the wires of the instrument the corrections for missed wires, flexure of the axis, level, azimuth, and collimation, including diurnal aberration, and subtracting the result from the apparent right ascension of the star. The remainder is the chronometer correction at the time of the star's meridian passage, affected by the residual error of the reduced observation. If we let

$e =$ this remainder,
$T =$ the time of meridian passage,
$T_0 =$ the time for which the chronometer correction is desired,
$\Delta T_0 =$ the chronometer correction at T_0, and
$r =$ the hourly rate of the chronometer,

each clock-star furnishes an equation of condition having the form

$$0 = e - \Delta T_0 + r\,(T - T_0)$$

The solution of these equations gave the rate r of the chronometer and the required correction ΔT_0, the probable error of which was found from the residuals in the usual manner.

This method was preferred to that of weighting the equations formed from each star according to the star's declination.

As the weather was almost uniformly clear, so that it was rare not to observe the stars on all the usual threads, no weighting of incomplete transits was practiced.

As the rate of the chronometers, especially No. 1295, was very small, and as the apparent rates each night were derived from the observations of that night only, frequently extending over three or four hours only, the apparent hourly rates so deduced are not to be considered as a criterion of the performance of the chronometers. A comparison of the chronometer corrections deduced on different nights showed that the chronometer rates were not only very small, but very steady.

Deduced from observations extending over one evening only, they are of course masked by errors of observation.

The time for which the chronometer corrections were computed was always the middle time between the first and the last time-signals.

The right ascensions of stars taken from the American Nautical Almanac have been in all cases corrected by Prof. S. Newcomb's tables of corrections to the apparent places of fundamental stars. In the Berlin Star List, the only other list used, these corrections have been introduced.

To guard against clerical errors, the chronograph sheets and fillets were all twice read, and collated with the record.

PERSONAL EQUATION.

In seeking to determine the correction to be applied to longitude determinations for the relative personal equation between Mr. Rock and myself, the following methods were employed:

1st. Observations of alternate stars with the same telescope by the two observers.

2d. Observations made with an absolute personal equation machine invented by Prof. J. R. Eastman, U. S. N., in which an artificial star is seen to cross an artificial diaphragm of ground glass having transit-lines ruled upon it. In this machine, the automative record on the chronograph registering the passage of the star over the ruled lines is compared with the chronographic record made by the observer of the same passage; the relative personal equation between the two observers being ascertained by comparing their respective absolute equations.

3d. A comparison of the results obtained in comparing two chronometers by causing them to record on the same chronograph with those obtained by sending five-second signals (as described on page 27) by means of telegraph keys and galvanometers.

4th. An exchange of stations by the two observers. In this case, measurements were made on four nights of the difference of longitude between the stations on the islands of St. Croix and St. Thomas. The observers then with their instruments exchanged stations, and the work was repeated on four nights in precisely the same way.

In the course of the work, it was sought to eliminate the personal equation as nearly as possible by stationing each observer as often east as west of the other.

The general conclusion drawn from the first three of these methods was that the personal equation was so small as to be masked by unavoidable errors of observation; but on exchanging stations the indication was unmistakable that when Mr. Rock

occupied the eastern station and I the western one, a correction of $+0^s.025$ should be applied to the longitude deduced.

DEDUCED LONGITUDE.

As the rate of the chronometers is so small that the difference between the times shown by their faces is practically the same throughout the time of exchanging signals, the middle time between the beginning and end of the exchange of time-signals is used as the time to which the chronometer corrections are reduced.

If we call this time T_0, and let

$\Delta T_e =$ the correction to the eastern chronometer at T_0;
$\Delta T_w =$ the correction to the western chronometer at T_0;
$T' =$ the difference between the chronometers by signals sent from east to west;
$T'' =$ the difference between the chronometers by signals sent from west to east;
$\omega =$ wave and armature time;
$\lambda' =$ the difference of longitude deduced from signals sent from east to west;
$\lambda'' =$ the difference of longitude deduced from signals sent from west to east;
$\lambda =$ the true difference of longitude:

then

$$\lambda' = (\Delta T_e - \Delta T_w) + T' + \omega$$
$$\lambda'' = \Delta T_e - \lambda T_w + T - \omega$$
$$\lambda = \tfrac{1}{2}(\lambda' + \lambda'')$$
$$\omega = \tfrac{1}{2}(\lambda' - \lambda'')$$

In the following tables, showing details of transit observations, the probable error of the chronometer correction is given for each night, rarely exceeding $0^s.02$.

The probable error of the comparison of the chronometers on each night seldom amounted to $0^s.004$, and never to more than $0^s.007$.

In the column marked "Chronometer correction," the quantities in brackets are the apparent corrections derived from circumpolar stars, and do not enter into the final determination of the chronometer corrections.

Transits of stars observed at Aspinwall, United States of Colombia, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1178.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1874.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Dec. 23	ϵ Piscium	W.	10	1 6 46.55	— 0.50	— 0.06	+ 0.07	— 1.08	— 0.94	44.04	0 56 27.21	— 10 16.83	— 0.07
	θ Ceti	W.	10	1 28 5.25	0.48	0.08	+ 0.62	1.09	0.85	3.37	1 17 46.60	16.77	— 0.13
	η Piscium	W.	10	1 35 7.31	0.51	0.10	— 0.19	1.11	0.82	4.58	1 24 47.66	16.92	+ 0.02
	o Piscium	W.	9	1 49 7.18	0.51	0.07	+ 0.03	1.09	0.78	4.76	1 38 47.69	17.07	+ 0.17
	α Arietis	W.	10	2 10 27.63	0.53	0.05	— 0.50	1.17	0.68	24.70	2 0 7.80	16.90	0.00
	γ Ceti	W.	10	2 47 5.61	0.50	0.12	+ 0.23	1.08	0.54	6.60	2 36 49.84	16.76	— 0.14
	α Ceti	W.	10	3 6 4.09	0.50	0.02	+ 0.20	1.08	0.47	2.22	2 55 45.23	16.99	+ 0.09
	α Persei	W.	10	3 25 46.74	— 0.59	0.10	— 1.95	— 1.65	0.40	42.05	3 15 24.89	17.16	0.26
	δ Persei	E	9	3 44 19.63	+ 0.58	0.10	1.81	+ 1.53	0.33	19.50	3 34 2.36	17.14	0.24
	ζ Persei	E.	10	3 56 33.73	0.54	0.17	0.88	1.22	0.28	34.16	3 46 17.21	16.95	0.05
	γ Tauri	E.	9	4 22 57.42	0.52	0.16	0.21	1.08	0.16	58.49	4 12 41.54	16.95	+ 0.05
	9 Camelopardalis	E.	10	4 51 58.02	0.68	0.04	— 4.11	2.56	— 0.05	57.06	4 41 39.85	[17.21]	.....
	δ Orionis	E.	10	5 35 53.01	0.49	0.16	+ 0.34	1.04	+ 0.12	54.84	5 25 38.15	16.69	— 0.21
	ϵ Orionis	E.	10	5 40 8.11	0.49	0.16	0.37	1.04	0.14	9.99	5 29 53.15	16.84	— 0.06
	α Columbæ	E.	9	5 45 22.52	0.44	0.14	1.66	1.25	0.16	25.89	5 35 8.74	17.15	+ 0.25
	α Orionis	E.	10	5 58 40.41	0.50	0.08	+ 0.07	+ 1.05	0.21	42.16	5 48 25.16	17.00	+ 0.10
	22 Camelopardalis	E.	9	6 15 24.98	0.71	0.30	— 4.89	2.94	0.28	23.72	6 5 6.82	[16.90]	.....
	μ Geminorum	E.	10	6 25 40.33	+ 0.53	— 0.02	— 0.49	+ 1.12	+ 0.31	41.78	6 15 24.84	— 10 16.94	+ 0.04

$a' = + 1^s.971$ (circle W.); $a'' = + 1^s.990$ (circle E.); $c = 1^s.055$ (+ with circle E.).
Chronometer No. 1178 at 5^h 8^m *fast* 10 $16^s.90 \pm 0^s.011$, *losing* $0^s.235$ per hour.

1874.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Dec. 24	ϵ Piscium	E.	10	1 6 38.06	+ 0.50	+ 0.16	+ 0.08	+ 0.59	— 0.25	39.14	0 56 27.20	— 10 11.94	+ 0.03
	Polaris	E.	1	1 24 1.27	3.94	2.61	—89.52	24.88	0.24	2.94	1 12 51.17	[11.77]	.....
	α Eridani	E.	5	1 43 10.93	0.36	0.23	+ 3.73	1.10	0.22	16.13	1 33 4.53	11.60	— 0.31
	β Arietis	E.	10	1 57 55.36	0.52	0.32	— 0.43	0.62	0.20	56.19	1 47 44.19	12.00	+ 0.09
	50 Cassiopeæ	E.	10	2 3 2.92	0.74	0.45	6.11	1.88	0.20	59.68	1 52 47.62	[12.06]	.....
	α Arietis	E.	10	2 10 18.98	0.53	0.32	— 0.54	0.64	0.19	19.74	2 0 7.79	11.95	+ 0.04
	ξ^1 Ceti	E.	6	2 16 33.44	0.50	0.34	+ 0.04	0.53	0.18	34.73	2 6 22.69	12.04	+ 0.13
	ι Cassiopeæ	E.	8	2 29 2.15	0.68	0.45	— 4.61	1.49	0.16	0.00	2 18 47.70	[12.30]	.....
	γ Ceti	E.	10	2 47 0.16	0.50	0.36	+ 0.25	0.59	0.15	1.71	2 36 49.84	11.87	— 0.04
	48 Cephei	E.	4	3 14 50.58	+ 0.85	0.17	— 9.05	+ 2.67	— 0.13	45.09	3 4 33.61	[11.48]	.....
	22 Camelopardalis	W.	6	6 15 27.49	— 0.71	0.34	6.93	— 1.78	+ 0.06	18.47	6 5 6.85	[11.62]	.....
	μ Geminorum	W.	10	6 25 38.59	0.53	0.22	0.70	0.68	0.07	36.97	6 15 24.85	12.12	+ 0.21
	γ Geminorum	W.	9	6 40 43.42	— 0.52	+ 0.17	— 0.37	— 0.65	+ 0.09	42.14	6 30 30.37	— 10 11.77	— 0.14

$a' = + 2^s.150$ (circle E.); $a'' = + 2^s.823$ (circle W.); $c = 0^s.608$ (+ with circle E.).
Chronometer No. 1178 at 5^h 15^m *fast* 10^m $11^s.91 \pm 0^s.039$, *losing* $0^s.061$ per hour.

Transits of stars observed at Panama, United States of Colombia, by Miles Rock, esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1874.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Dec. 23	o Piscium	E.	9	1 47 33.82	+ 0.55	+ 0.43	+ 0.04	+ 1.41	— 0.17	36.06	1 38 47.69	— 8 48.39	— 0.03
	50 Cassiopeæ, U. C	E.	9	2 1 46.50	0.79	— 0.03	—15.52	4.47	0.16	36.05	1 52 47.70	[48.35]	.....
	ξ^1 Ceti	E.	11	2 15 9.25	0.55	0.05	+ 0.07	1.41	0.15	11.08	2 6 22.70	48.38	— 0.04
	ι Cassiopeæ, U. C	E.	9	2 27 43.88	0.73	0.09	—11.72	3.54	0.14	36.20	2 18 47.75	[48.45]	.....
	γ Ceti	E.	11	2 45 36.03	+ 0.54	— 0.13	+ 0.60	+ 1.40	— 0.12	38.32	2 36 49.85	— 8 48.47	+ 0.05
	α Ceti	W.	9	3 4 35.66	— 0.54	— 0.47	+ 0.52	— 1.44	— 0.11	33.62	2 55 45.23	— 8 48.39	— 0.03
	48 Cephei, U. C	W.	9	3 13 53.96	0.91	0.79	—23.55	6.51	0.10	22.10	3 4 33.69	[48.41]	.....
	α Persei	W.	11	3 24 22.43	0.63	0.48	5.57	2.22	0.09	13.44	3 15 24.90	48.54	+ 0.12
	δ Persei	W.	7	3 42 59.58	0.62	0.52	— 5.12	2.12	0.07	51.13	3 34 2.37	[48.76]	.....
	γ^1 Eridani	W.	11	4 1 1.48	0.51	0.46	+ 2.23	1.48	0.06	1.20	3 52 12.71	48.49	+ 0.07
	γ Tauri	W.	10	4 21 33.27	— 0.56	— 0.52	— 0.64	— 1.49	— 0.04	30.01	4 12 41.53	— 8 48.48	+ 0.06
	Groom. 966, U. C	W.	11	5 31 52.62	— 0.85	+ 0.28	+ 7.78	— 5.53	+ 0.02	54.32	5 23 5.23	— 8 [49.09]	.....
	α Columbæ	W.	8	5 43 60.85	0.48	0.16	— 1.82	1.75	0 03	56.99	5 35 8.73	48.26	— 0.16
	22 Camelopard., U. C	W.	11	6 13 53.98	0.76	0.17	+ 5.45	4.07	0.06	54.83	6 5 6.79	[48.04]	.....
	μ Geminorum	W.	11	6 24 14.58	0.57	0.11	+ 0.56	1.55	0.07	13.20	6 15 24.82	48.38	— 0.04
	Canopus	W.	11	6 30 7.46	0.42	0.06	— 3.20	2.37	0.07	1.60	6 21 12.70	[48.90]	.....
	γ Geminorum	W.	11	6 39 20.33	— 0.56	+ 0.08	+ 0.30	— 1.50	+ 0.08	18.73	6 30 30.34	— 8 48.39	— 0.03

$a_1 = + 5^s.442$ (circle E.); $a_2 = + 5^s.582$ (circle west, 1st group); $a_3 = - 2^s.209$ (circle west, 2d group).
$c = + 1^s.414$ (circle east); chronometer No. 1254 at $5^h\ 9^m$ *fast* $8^m\ 48^s.43 \pm 0^s.017$, *losing* $0^s.052$ per hour.

1874.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Dec. 24	50 Cassiopeæ, U. C	E.	9	2 1 36.18	+ 0.79	+ 0.09	— 5.92	+ 3.97	— 0.18	34.93	1 52 47.62	— 8 [47.31]	.....
	ι Cassiopeæ, U. C	E.	11	2 27 35.62	0.73	+ 0.07	— 4.47	3.15	0.15	32.95	2 18 47.70	[47.25]	.....
	γ Ceti	E.	6	2 45 35.70	0.54	0.00	+ 0.23	1.24	0.14	37.57	2 36 49.84	47.73	— 0.12
	α Ceti	E.	11	3 4 31.13	0.54	+ 0.01	+ 0.19	1.24	0.12	32.99	2 55 45.22	47.77	— 0.08
	48 Cephei, U. C	E.	6	3 13 24.13	+ 0.91	+ 0.05	— 8.75	+ 5.62	— 0.11	21.85	3 4 33.61	— 8 [48.24]	.....
	48 Cephei, U. C	W.	3	3 13 39.17	— 0.91	— 0.07	—11.16	— 5.81	— 0.11	21.11	3 4 33.61	— 8 [47.50]	.....
	α Persei	W.	10	3 24 18.27	0.63	0.07	2.64	1.96	0.10	12.87	3 15 24.89	47.98	+ 0.13
	δ Persei	W.	10	3 42 55.54	0.62	0.12	— 2.43	1.89	0.09	50.39	3 34 2.36	48.03	0.18
	γ^1 Eridani	W.	11	4 1 1.62	0.51	0.21	+ 1.06	1.32	0.07	0.57	3 52 12.71	47.86	+ 0.01
	γ Tauri	W.	11	4 21 31.86	0.56	0.24	— 0.30	1.33	0.05	29.38	4 12 41.54	47.84	— 0.01
	ε Tauri	W.	11	4 30 10.33	0.56	0.25	0.48	1.35	0.04	7.65	4 21 19.82	47.83	0.02
	α Tauri	W.	11	4 37 35.97	0.56	0.25	0.35	1.33	0.03	33.45	4 28 45.68	47.77	— 0.08
	9 Camelopard., U. C	W.	11	4 50 37.98	— 0.72	— 0.35	— 5.49	— 3.16	— 0.02	28.24	4 41 40.01	— 8 [48.23]	.....
	α Orionis	W.	11	5 57 14.98	— 0.54	— 0.27	+ 0.07	— 1.29	+ 0.04	12.99	5 48 25.17	— 8 47.82	— 0.03
	22 Camelopard., U. C	W.	11	6 13 66.61	0.76	0.41	— 6.79	3.63	0.06	55.08	6 5 6.84	[48.24]	.....
	μ Geminorum	W.	11	6 24 15.63	0.57	0.32	— 0.70	1.39	0.06	12.71	6 15 24.85	47.86	+ 0.01
	Canopus	W.	11	6 29 59.28	0.42	0.24	+ 3.99	2.11	0.07	60.57	6 21 12.71	47.86	+ 0.01
	γ Geminorum	W.	11	6 39 20.69	0.56	0.32	— 0.38	1.33	0.08	18.18	6 30 30.37	47.81	— 0.04
	51 Cephei, U. C	W.	4	6 50 114.20	— 2.27	— 1.47	—55.90	—26.54	+ 0.09	28.11	6 41 40.20	— 8 [47.91]	.....

$a^1 = + 2^s.074$ (circle east); $a_2 = + 2^s.645$ (circle west, 1st group); $a_3 = + 2^s.753$ (circle west, 2d group).
$c = + 1^s.259$ (circle east); chronometer No. 1254 at $5^h\ 16^m$ *fast* $8^m\ 47^s.55 \pm 0^s.016$, *losing* $0^s.055$ per hour.

Transits of stars observed at Aspinwall, United States of Colombia, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Jan. 4	48 Cephei	E.	3	3 15 22.90	+ 0.85	− 0.01	−27.87	− 1.28	+ 0.06	54.65	3 4 33.01	[− 10 21.64]	.....
	η Tauri	E.	10	3 50 27.11	0.53	0.06	1.79	0.31	0.04	25.52	3 40 3.86	21.66	− 0.03
	γ Tauri	E.	10	4 23 3.57	0.52	− 0.10	0.72	0.31	0.03	2.99	4 12 41.54	21.45	− 0.24
	ε Tauri	E.	10	4 31 42.56	0.52	+ 0.06	1.16	0.30	0.02	41.70	4 21 19.82	21.88	+ 0.19
	α Tauri	E.	10	4 39 7.92	0.52	− 0.01	0.83	0.29	0.02	7.33	4 28 45.69	21.64	− 0.05
	9 Camelopardalis	E.	10	4 52 15.51	0.68	0.18	13.69	0.70	0.01	1.63	4 41 39.81	[21.82]	.....
	11 Orionis	E.	10	5 7 48.74	+ 0.52	− 0.01	− 0.70	− 0.29	+ 0.01	48.27	4 57 26.47	− 10 21.80	+ 0.11

$a = + 6^s.626$; $c = - 0^s.263$.
Chronometer No. 1295 at $5^h\ 23^m$ *fast* $10^m\ 21^s.69 \pm 0^s.048$, *gaining* $0^s.028$ per hour.
The rate used is that found from the observed correction on January 5.

1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Jan. 5	ε Piscium	W.	10	1 49 9.56	− 0.60	+ 0.16	+ 0.02	+ 0.82	− 0.07	9.89	1 38 47.56	− 10 22.33	− 0.04
	β Arietis	W.	7	1 58 6.39	0.62	0.36	− 0.29	0.87	0.07	6.64	1 47 44.03	22.61	+ 0.24
	50 Cassiopeæ	W.	7	2 3 11.20	0.87	0.35	4.06	2.58	0.07	9.13	1 52 46.92	[22.21]	.....
	α Arietis	W.	7	2 10 30.07	0.62	0.27	− 0.36	0.88	0.07	30.17	2 0 7.67	22.50	+ 0.13
	ξ^1 Ceti	W.	6	2 16 44.51	0.60	0.29	+ 0.03	0.82	0.07	44.98	2 6 22.59	22.39	+ 0.02
	ι Cassiopeæ	W.	7	2 29 10.21	0.80	0.45	− 2.44	2.06	0.06	9.42	2 18 47.29	[22.13]	.....
	γ Ceti	W.	9	2 47 11.56	0.58	0.08	+ 0.13	0.81	0.05	11.95	2 36 49.75	22.20	− 0.17
	α Ceti	W.	10	3 6 6.79	0.59	0.34	+ 0.12	0.81	0.05	7.42	2 55 45.15	22.27	− 0.10
	48 Cephei	W.	8	3 14 56.64	− 1.00	+ 0.52	− 4.80	+ 3.67	0.04	54.99	3 4 32.95	[22.04]	.....
	η Tauri	E.	10	3 50 26.69	+ 0.63	− 0.03	0.34	− 0.92	0.03	26.00	3 40 3.85	22.15	− 0.22
	γ Tauri	E.	10	4 23 4.05	0.61	+ 0.14	0.14	0.88	0.02	3.76	4 12 41.54	22.22	0.15
	ε Tauri	E.	10	4 31 42.41	0.61	0.21	0.22	0.90	0.02	42.09	4 21 19.82	22.27	0.10
	α Tauri	E.	10	4 39 8.34	0.61	0.11	0.16	0.88	0.02	8.00	4 28 45.69	22.31	− 0.06
	9 Camelopardalis	E.	5	4 52 5.63	0.80	0.12	2.58	2.10	0.01	1.86	4 41 39.80	[22.06]	.....
	ι Aurigæ	E.	10	4 59 15.27	0.64	0.21	0.60	1.01	0.01	14.50	4 48 52.14	22.36	− 0.01
	11 Orionis	E.	6	5 7 49.23	0.61	0.20	− 0.13	0.88	− 0.01	49.02	4 57 26.47	22.55	+ 0.18
	α Orionis	E.	10	5 58 47.69	0.60	0.24	+ 0.04	0.86	+ 0.01	47.72	5 48 25.26	22.46	+ 0.09
	α Argus	E.	10	6 31 33.94	0.45	0.24	+ 1.82	1.40	0.02	35.07	6 21 12.74	22.33	− 0.04
	δ Geminorum	E.	10	7 23 3.22	0.62	0.31	− 0.30	0.92	0.04	2.97	7 12 40.56	22.41	+ 0.04
	Piazzi VII, 67	E.	8	7 28 21.62	0.83	0.39	2.96	2.34	0.04	17.58	7 17 54.97	[22.61]	.....
	α Geminorum	E.	10	7 37 1.59	0.64	0.30	− 0.57	1.00	0.05	1.01	7 26 38.61	22.40	+ 0.03
	α Canis Minor	E.	9	7 43 8.67	+ 0.59	+ 0.30	+ 0.08	− 0.85	+ 0.05	8.84	7 32 46.47	− 10 22.37	0.00

$a' = + 1^s.433$ (ξ^1 Ceti et super circle W.); $a'' = + 1^s.138$ (ι Cassiop. et sub circle W.); $a''' = + 1^s.247$ (circle E.); $c = 0^s.329$ (+ with circle W.).
Chronometer No. 1295 at $5^h\ 25^m$ *fast* $10^m\ 22^s.37 \pm 0^s.020$, *losing* $0^s.021$ per hour.

Transits of stars observed at Panama, United States of Colombia, by Miles Rock, esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Jan. 4	48 Cephei, U. C	W.	3	3 13 16.41	— 0.91	0.00	+ 1.56	— 1.18	— 0.04	15.84	3 4 33.02	— 8 [42.82]	.....
	η Tauri	W.	7	3 48 48.64	0.57	— 0.06	+ 0.10	0.28	0.03	47.80	3 40 3.86	43.94	+ 0.04
	γ¹ Eridani	W.	6	4 0 57.67	0.51	0.08	— 0.16	0.27	0.03	56.62	3 52 12.67	43.95	+ 0.05
	γ Tauri	W.	11	4 21 26.23	0.56	0.07	+ 0.04	0.27	0.02	25.35	4 12 41.54	43.81	— 0.09
	ε Tauri	W.	11	4 30 4.70	0.56	0.08	0.07	0.27	0.02	3.84	4 21 19.82	44.02	+ 0.12
	α Tauri	W.	11	4 37 30.33	0.56	0.09	0.05	0.27	0.02	29.44	4 28 45.69	43.75	— 0.15
	9 Camelopard., U. C.	W.	11	4 50 24.66	0.72	0.13	0.77	0.64	0.01	23.93	4 41 39.96	[43.97]	.....
	ι Aurigæ	W.	9	4 55 36.86	0.59	0.12	0.18	0.31	0.01	36.01	4 48 52.14	43.87	— 0.03
	11 Orionis	W.	10	5 6 11.32	0.56	0.12	+ 0.04	0.27	— 0.01	10.40	4 57 26.47	43.93	+ 0.03
	ε Orionis	W.	10	5 38 38.13	0.53	0.21	— 0.06	0.26	+ 0.01	37.08	5 29 53.22	43.86	— 0.04
	22 Camelopard., U. C.	W.	10	6 13 51.85	— 0.76	— 0.14	+ 0.91	— 0.74	0.02	51.14	6 5 7.03	[44.11]	.....
	δ Ursæ Minoris, L. C.	W.	5	6 21 3.61	+ 0.88	+ 0.18	— 6.22	+ 4.37	0.02	2.84	18 12 18.29	[44.55]	.....
	γ Geminorum	W.	7	6 39 15.27	— 0.56	— 0.13	+ 0.05	— 0.27	0.03	14.39	6 30 30.51	43.88	— 0.02
	51 Cephei, U. C	W.	4	6 50 26.67	— 2.27	— 0.50	+ 7.51	— 5.40	+ 0.03	26.04	6 41 41.41	— 8 [44.63]	.....
	51 Cephei, U. C	E.	4	6 50 8.62	+ 2.27	+ 0.50	+ 9.39	+ 4.57	+ 0.03	25.38	6 41 41.41	— 8 [43.97]	.....
	δ Canis Majoris	E.	10	7 12 3.21	0.49	0.07	— 0.29	0.24	0.04	3.76	7 3 19.74	44.02	+ 0.12
	δ Geminorum	E.	11	7 21 23.43	0.57	0.11	+ 0.12	0.24	0.04	24.51	7 12 40.54	43.97	+ 0.07
	Piazzi VII, 67, U. C.	E.	10	7 26 36.30	0.75	+ 0.14	1.10	0.61	0.04	38.94	7 17 54.94	[44.00]	.....
	α Geminorum	E.	11	7 35 21.33	0.59	— 0.08	+ 0.22	0.26	0.04	22.36	7 26 38.60	43.76	— 0.14
	Procyon	E.	11	7 41 29.61	+ 0.54	— 0.01	— 0.03	+ 0.22	+ 0.05	30.38	7 32 46.46	— 8 43.92	+ 0.02

$a_1 = -0^s.361$ (circle W.); $a_2 = -0^s.472$ (circle E.); $c = +0^s.230$ (circle E.).
Chronometer No. 1254 at $5^h\ 23^m$ *fast* $8^m\ 43^s.90 \pm 0^s.016$, *losing* $0^s.026$ per hour.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Jan. 5	ξ Persei	W.	9	3 55 1.64	— 0.58	+ 0.13	+ 0.07	— 0.33	+ 0.10	1.03	3 46 17.17	— 8 43.86	— 0.02
	γ¹ Eridani	W.	11	4 0 57.27	0.51	0.04	— 0.06	0.29	0.09	56.54	3 52 12.66	43.88	0.00
	γ Tauri	W.	11	4 21 26.04	0.56	0.14	+ 0.02	0.29	0.07	25.42	4 12 41.53	43.89	+ 0.01
	ε Tauri	W.	11	4 30 4.38	0.56	0.17	0.03	0.29	0.06	3.79	4 21 19.82	43.97	+ 0.09
	α Tauri	W.	11	4 37 30.14	0.56	0.19	0.03	0.29	0.05	29.55	4 28 45.68	43.87	— 0.01
	9 Camelopard., U. C.	W.	9	4 50 24.82	0.72	0.12	0.31	0.70	0.04	23.87	4 41 39.94	[43.93]	.....
	ι Aurigæ	W.	11	4 57 36.78	0.59	0.13	0.07	0.34	0.03	36.08	4 48 52.13	43.95	+ 0.07
	11 Orionis	W.	9	5 6 11.13	— 0.56	+ 0.05	+ 0.02	— 0.29	+ 0.02	10.37	4 57 26.47	— 8 43.90	+ 0.02
	ε Orionis	W.	11	5 38 37.61	— 0.53	+ 0.02	+ 0.08	— 0.28	— 0.02	36.88	5 29 53.22	— 8 43.66	— 0.22
	α Columbæ	W.	9	5 43 53.07	0.48	0.03	0.38	0.34	0.02	52.64	5 35 8.75	43.89	+ 0.01
	α Orionis	W.	10	5 57 9.77	0.54	0.11	+ 0.01	0.28	0.03	9.04	5 48 25.26	43.78	— 0.10
	22 Camelopard., U. C.	W.	10	6 13 53.82	— 0.76	+ 0.11	— 1.14	— 0.60	0.05	51.18	6 5 7.04	[44.14]	.....
	δ Ursæ Minoris, L. C	W.	5	6 20 49.17	+ 0.88	0.00	+ 7.75	+ 4.72	— 0.06	62.46	18 12 18.27	[44.19]	.....
	Canopus	W.	11	6 29 57.11	— 0.42	+ 0.04	+ 0.67	— 0.46	— 0.07	56.87	6 21 12.73	— 8 44.14	+ 0.26
	51 Cephei, U. C	E.	2	6 50 23.13	+ 2.27	+ 0.72	— 5.71	+ 5.00	— 0.10	25.31	6 41 41.53	— 8 [43.78]	.....
	δ Canis Majoris	E.	9	7 12 2.67	0.49	0.09	+ 0.18	0.27	0.12	3.58	7 3 19.74	43.84	— 0.04
	α Geminorum	E.	7	7 35 21.81	0.59	0.10	— 0.13	0.28	0.14	22.51	7 26 38.61	43.90	+ 0.02
	Procyon	E.	8	7 41 29.60	+ 0.54	+ 0.10	+ 0.02	+ 0.24	— 0.15	30.35	7 32 46.47	— 8 43.88	0.00

$a_1 = -0^s.150$ (circle W., 1st group); $a_2 = +0^s.461$ (circle W., 2d group); $a_3 = +0^s.281$ (circle E.)
Chronometer No. 1254 at $5^h\ 24^m$ *fast* $8^m\ 43^s.88 \pm 0^s.019$, *gaining* $0^s.064$ per hour; $c = +0^s.261$ (circle E.).

Transits of stars observed at Kingston, Jamaica, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Jan. 25	γ Ceti	E.	10	2 34 54.41	+ 0.54	— 0.07	+ 0.38	+ 0.66	+ 0.34	56.26	2 36 49.54	+ 1 53.28	+ 0.33
	γ Tauri	E.	11	4 10 46.43	0.58	0.06	+ 0.07	0.69	0.23	47.94	4 12 41.40	53.46	0.15
	ε Tauri	E.	11	4 19 24.75	0.59	0.13	— 0.02	0.70	0.22	26.11	4 21 19.69	53.58	+ 0.03
	α Tauri	E.	10	4 26 50.46	+ 0.58	— 0.08	+ 0.05	+ 0.69	0.21	51.91	4 28 45.57	53.66	— 0.05
	ε Ursæ Minoris, S. P.	E.	11	4 56 46.68	— 0.73	+ 0.10	10.67	— 4.90	0.17	51.99	16 58 45.55	[53.56]	.....
	β Orionis	E.	8	5 6 37.09	+ 0.50	— 0.06	+ 0.65	+ 0.67	0.16	39.01	5 8 32.73	53.72	— 0.11
	β Tauri	E.	11	5 16 29.67	0.63	0.17	— 0.30	0.76	0.14	30.73	5 18 24.37	53.64	— 0.03
	Groombridge 966	E.	2	5 21 11.92	1.18	0.31	— 4.72	2.55	0.14	10.76	5 23 4.82	[54.06]	.....
	δ Orionis	E.	11	5 23 42.60	0.53	0.14	+ 0.46	0.66	0.14	44.25	5 25 38.17	53.92	— 0.31
	ε Orionis	E.	10	5 27 57.82	0.53	0.13	0.48	0.66	0.13	59.49	5 29 53.18	53.69	— 0.08
	α Orionis	E.	11	5 46 29.92	+ 0.56	0.13	+ 0.27	+ 0.67	+ 0.11	31.40	5 48 25.27	53.87	— 0.26
	β Geminorum	W.	11	7 35 50.17	— 0.63	— 0.45	— 0.37	— 0.80	— 0.03	47.89	7 37 41.39	53.50	+ 0.11
	λ Ursæ Minoris, S. P.	W.	6	7 43 36.53	+ 8.71	+ 5.18	+93.89	+37.52	0.07	1.76	19 47 54.61	[52.85]	.....
	ε Hydræ	W.	9	8 38 18.68	— 0.55	— 0.41	+ 0.36	— 0.71	0.11	17.26	8 40 10.63	53.37	— 0.18
	ι Ursæ Majoris	W.	11	8 48 50.74	0.73	0.39	— 1.41	1.06	0.12	47.03	8 50 40.72	53.69	— 0.08
	κ Cancri	W.	11	8 59 7.86	0.56	0.35	+ 0.22	0.72	0.14	6.31	9 0 59.83	53.52	+ 0.09
	1 Draconis	W.	10	9 17 42.03	— 1.75	— 1.08	—11.67	— 4.97	— 0.16	22.40	9 19 18.06	[+1 55.66]	.....

$a' = + 1^s.462$ (circle E.); $a'' = + 1^s.636$ (circle W.); $c = 0^s.682$ (+ with circle E.).
Chronometer No. 1295 at $7^h\ 9^m$ *slow* $1^m\ 53^s.61 \pm 0^s.036$, *gaining* $0^s.076$ per hour.

1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Jan. 26	α Persei	E.	11	3 13 29.34	+ 0.73	+ 0.25	+ 0.47	+ 0.08	— 0.03	30.84	3 15 24.38	+ 1 53.54	— 0.03
	δ Persei	E.	11	3 32 7.07	0.72	0.18	0.43	0.08	0.03	8.45	3 34 1.95	53.50	+ 0.01
	η Tauri	E.	11	3 38 9.22	0.61	0.22	+ 0.06	0.06	0.03	10.14	3 40 3.66	53.52	— 0.01
	γ^1 Eridani	E.	11	3 50 18.67	0.49	0.13	— 0.32	0.06	0.03	19.00	3 52 12.46	53.46	+ 0.05
	γ Tauri	E.	11	4 10 47.05	0.58	0.24	— 0.03	0.06	0.03	47.87	4 12 41.39	53.52	— 0.01
	ε Tauri	E.	11	4 19 25.21	+ 0.59	+ 0.19	+ 0.01	+ 0.06	0.03	26.03	4 21 19.68	53.65	— 0.14
	ε Ursæ Minoris, S. P.	E.	11	4 56 57.86	— 0.73	— 0.25	— 4.30	— 0.39	0.02	52.17	16 58 45.67	[53.50]	.....
	Groombridge 966	E.	9	5 21 6.86	+ 1.18	+ 0.19	+ 1.91	+ 0.20	0.02	10.32	5 23 4.79	[54.47]	.....
	22 Camelopardalis	E.	3	6 3 10.96	0.99	0.51	1.31	0.15	— 0.01	13.91	6 5 6.94	[53.03]	.....
	51 Cephei	E.	4	6 39 18.67	+ 4.12	1.62	+21.22	+ 1.10	0.00	46.73	6 41 40.97	[54.24]	.....
	λ Ursæ Minoris, S. P.	E.	5	7 47 9.60	— 8.70	+ 0.85	—55.58	— 2.83	0.00	3.34	19 47 54.76	[51.42]	.....
	15 Argus	E.	11	8 0 21.22	+ 0.46	— 0.08	0.80	+ 0.06	+ 0.01	20.87	8 2 14.52	53.65	— 0.14
	ε Hydræ	E.	11	8 38 16.64	0.55	— 0.02	— 0.20	0.05	0.01	17.03	8 40 10.64	53.61	— 0.10
	ι Ursæ Majoris	E.	11	8 48 45.47	0.72	+ 0.10	+ 0.84	0.08	0.01	47.22	8 50 40.73	53.51	0.00
	κ Cancri	E.	7	8 59 5.87	0.57	— 0.02	— 0.13	0.05	0.01	6.35	9 0 59.84	53.49	+ 0.02
	1 Draconis	E.	11	9 17 13.95	1.74	— 0.22	6.95	0.38	0.01	22.81	9 19 17.58	[54.77]	.....
	ε Leonis	E.	11	9 36 52.83	0.62	+ 0.02	0.13	0.06	0.01	53.67	9 38 46.66	52.99	+ 0.52
	μ Leonis	E.	11	9 43 46.24	+ 0.62	+ 0.02	+ 0.19	+ 0.06	+ 0.01	47.14	9 45 40.57	+ 1 53.43	+ 0.08

$a' = - 0^s.590$ (22 Camelop. et super); $a'' = - 1^s.093$ (51 Cephei et sub.); $c = + 0^s.073$.
Chronometer No. 1295 at $7^h\ 16^m$ *slow* $1^m\ 53^s.51 \pm 0^s.019$, *losing* $0^s.009$ per hour.

Transits of stars observed at Aspinwall (Colon), United States of Colombia, by Miles Rock, esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Jan. 25	γ Tauri	E.	11	4 22 55.90	+ 0.57	+ 0.05	+ 0.02	− 0.05	+ 0.12	56.61	4 12 41.40	− 10 15.21	+ 0.07
	ε Tauri	E.	11	4 31 34.05	0.57	0.06	0.04	0.05	0.11	34.78	4 21 19.69	15.09	− 0.05
	Aldebaran	E.	10	4 38 59.89	0.57	0.07	0.03	0.05	0.11	60.62	4 28 45.57	15.05	0.09
	9 Camelopard., U. C.	E.	7	4 51 53.70	0.74	0.16	0.43	0.12	0.10	55.01	4 41 39.55	[15.46]	.....
	11 Orionis	E.	11	5 7 40.71	0.57	0.13	+ 0.02	0.05	0.09	41.47	4 57 26.40	15.07	− 0.07
	β Orionis	E.	11	5 18 47.26	0.53	0.15	− 0.06	0.05	0.03	47.91	5 8 32.72	15.19	+ 0.05
	β Tauri	E.	10	5 28 28.85	0.59	0.15	+ 0.08	0.06	0.07	39.68	5 18 24.37	15.31	+ 0.17
	Groom. 966, U. C	E.	6	5 33 18.18	+ 0.88	+ 0.17	+ 0.52	− 0.19	+ 0.07	19.63	5 23 4.81	− 10 [14.82]	.....
	Groom. 966, U. C	W.	2	5 33 19.60	− 0.88	+ 0.06	+ 0.95	+ 0.04	+ 0.07	19.84	5 23 4.81	− 10 [15.03]	.....
	ε Orionis	W.	11	5 40 8.77	0.54	0.04	− 0.05	0.01	0.06	8.29	5 29 53.17	15.12	− 0.02
	α Orionis	W.	11	5 58 40.79	0.55	0.11	− 0.01	0.01	0.05	40.40	5 48 25.27	15.13	− 0.01
	22 Camelopard., U. C.	W.	11	6 15 22.24	0.78	0.11	+ 0.66	0.03	0.04	22.30	6 5 6.94	[15.36]	.....
	μ Geminorum	W.	11	6 25 40.64	− 0.58	+ 0.07	+ 0.07	+ 0.01	+ 0.03	40.24	6 15 25.05	− 10 15.19	+ 0.05
	α Geminorum	W.	9	7 36 54.22	− 0.60	+ 0.14	+ 0.15	+ 0.01	− 0.02	53.96	7 26 38.85	− 10 15.11	− 0.03
	Procyon	W.	11	7 43 2.16	0.55	0.13	− 0.02	0.01	0.02	1.71	7 32 46.67	15.04	− 0.10
	β Geminorum	W.	11	7 47 56.91	0.59	+ 0.16	+ 0.12	0.01	0.03	56.58	7 37 41.39	15 19	+ 0.05
	3 Ursæ Majoris, U. C.	W.	11	8 10 40.13	0.77	− 0.08	+ 0.76	0.03	0.04	40.03	8 0 25.19	[14.84]	.....
	ε Hydræ	W.	11	8 50 26.26	0.55	0.05	− 0.01	0.01	0.07	25.59	8 40 10.63	14.96	− 0.18
	ι Ursæ Majoris	W.	11	9 0 56.49	0.64	0.05	+ 0.30	0.02	0.08	56.04	8 50 40.71	15.33	+ 0.19
	σ^2 Ursæ Majoris, U. C.	W.	6	9 9 41.71	− 0.76	− 0.11	+ 0.71	+ 0.03	− 0.09	41.49	8 59 26.24	− 10 [15.25]	.....

$a_1 = -0^s.208$ (circle E.); $a_2 = -0^s.270$ (circle W., 1st group to μ Geminorum); $a_2 = -0^s.319$ (circle W., 2d group); $c = -0^s.030$ circle E.).
Chronometer No. 1254 at $7^h\ 0^m$ *fast* $10^m\ 15^s.14 \pm 0^s.018$, *gaining* $0^s.042$ per hour.

1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Jan. 26	γ Tauri	E.	11	4 22 56.08	+ 0.57	+ 0.04	+ 0.02	− 0.11	+ 0.07	56.67	4 12 41.39	− 10 15.28	− 0.10
	ε Tauri	E.	9	4 31 34.52	0.57	0.00	0.03	0.11	0.07	35.08	4 21 19.68	15.40	+ 0.02
	Aldebaran	E.	11	4 39 0.36	0.57	− 0.01	0.02	0.11	0.06	0.89	4 28 45.56	15.33	− 0.05
	9 Camelopard., U. C.	E.	3	4 51 53.97	0.74	+ 0.03	0.38	0.25	0.06	54.93	4 41 39.52	[15.41]	.....
	ι Aurigæ	E.	11	4 59 6.84	0.60	0.02	+ 0.09	0.12	0.05	7.48	4 48 52.02	15.46	+ 0.08
	β Orionis	E.	9	5 18 47.49	0.53	0.05	− 0.06	0.10	0.05	47.96	5 8 32.72	15.24	− 0.14
	β Tauri	E.	11	5 28 39.02	0.59	0.11	+ 0.07	0.12	0.04	39.71	5 18 24.36	15.35	− 0.03
	Groom. 966, U. C	E.	2	5 33 18.79	+ 0.88	+ 0.19	+ 0.65	− 0.39	+ 0.04	20.16	5 23 4.78	− 10 [15.38]	.....
	ε Orionis	W.	9	5 40 8.92	− 0.54	+ 0.20	0.00	+ 0.06	+ 0.04	8.68	5 29 53.17	− 10 15.51	+ 0.13
	α Orionis	W.	11	5 58 41.18	0.55	− 0.01	+ 0.00	0.06	0.03	40.71	5 48 25.27	15.44	+ 0.06
	22 Camelopard., U. C.	W.	11	6 15 22.98	0.78	+ 0.03	− 0.06	0.18	0.02	22.37	6 5 6.93	[15.44]	.....
	μ Geminorum	W.	11	6 25 40.87	0.58	− 0.01	0.01	0.07	0.02	40.36	6 15 25.06	15.30	− 0.08
	Canopus	W.	11	6 31 28.30	− 0.43	− 0.02	+ 0.03	+ 0.10	+ 0.02	28.00	6 21 12.53	− 10 15.47	+ 0.09
	ι Ursæ Majoris	W.	10	9 0 56.86	− 0.64	− 0.04	− 0.13	+ 0.09	− 0.04	56.10	8 50 40.73	− 10 15.37	− 0.01
	σ^2 Ursæ Majoris, U. C.	W.	5	9 9 42.33	0.76	− 0.10	− 0.31	0.16	0.05	41.27	8 59 26.27	[15.00]	.....
	κ Cancri	W.	10	9 11 15.83	0.56	+ 0.01	0.00	0.06	0.05	15.29	9 0 59.84	15.45	+ 0.07
	1 Draconis, U. C	W.	4	9 29 34.92	− 1.17	− 0.19	− 0.94	+ 0.44	0.05	33.01	9 19 17.57	[15.44]	.....
	1 Draconis, U. C	E.	3	9 29 32.94	+ 1.17	+ 0.59	0.94	− 0.72	0.06	32.98	9 19 17.57	[15.41]	.....
	ε Leonis	E.	11	9 49 1.30	+ 0.58	+ 0.25	− 0.04	− 0.11	− 0.06	1.92	9 38 46.65	− 10 15.27	− 0.11

$a_1 = -0^s.185$ (circle E.); $a_2 = +0^s.023$ (circle W,. 1st group to Canopus); $a_2 = +0^s.139$ (circle W., 2d group); $c = -0^s.062$ (circle E.).
Chronometer No. 1254 at $7^h\ 15^m$ *fast* $10^m\ 15^s.38 \pm 0^s.016$, *gaining* $0^s.024$ per hour.

Transits of stars observed at Kingston, Jamaica, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Jan. 28	γ^1 Eridani	E.	11	3 50 18.77	+ 0.49	— 0.03	+ 0.01	+ 0.57	+ 0.12	19.93	3 52 12.43	+ 1 52.50	0.00
	γ Tauri	E.	11	4 10 47.60	0.58	0.05	0.00	0.58	0.11	48.82	4 12 41.37	52.55	— 0.05
	ϵ Tauri	E.	11	4 19 25.88	0.59	0.02	0.00	0.59	0.10	27.14	4 21 19.66	52.52	0.02
	α Tauri	E.	11	4 26 51.82	+ 0.58	— 0.05	0.00	+ 0.58	0.10	53.03	4 28 45.54	52.51	— 0.01
	ϵ Ursæ Minoris, S. P	E.	11	4 56 57.32	— 0.73	+ 0.08	+ 0.17	— 4.09	0.08	52.83	16 58 45.91	[53.08]	.....
	β Orionis	E.	11	5 6 39.20	+ 0.51	— 0.08	+ 0.01	+ 0.56	0.08	40.22	5 8 32.70	52.42	+ 0.08
	β Tauri	E.	11	5 16 30.53	0.63	0.13	— 0.01	0.63	0.07	31.72	5 18 24.35	52.63	— 0.13
	Groombridge 966	E.	11	5 21 7.53	1.18	0.33	— 0.07	2.13	0.06	10.50	5 23 4.70	[54.20]	.....
	ϵ Orionis	E.	11	5 27 59.74	0.53	0.13	+ 0.01	0.55	0.06	0.76	5 29 53.16	52.40	+ 0.10
	α Orionis	E.	11	5 46 31.72	0.56	0.15	0.00	0.56	0.05	32.74	5 48 25.26	52.52	— 0.02
	22 Camelopardalis	E.	3	6 3 11.68	+ 0.99	0.23	— 0.05	+ 1.57	+ 0.04	14.00	6 5 6.90	[52.90]	.....
	ι Ursæ Majoris	W.	11	8 48 50.23	— 0.73	0.22	+ 0.16	— 0.90	— 0.04	48.50	8 50 40.76	52.26	+ 0.24
	κ Cancri	W.	11	8 59 8.73	0.57	0.20	— 0.03	0.61	0.06	7.26	9 0 59.87	52.61	— 0.11
	1 Draconis	W.	11	9 17 30.41	1.75	0.50	+ 1.36	4.20	0.07	25.25	9 19 17.71	[52.46]	.....
	ϵ Leonis	W.	11	9 36 55.55	0.62	0.13	0.03	0.65	0.08	54.10	9 38 46.69	52.59	— 0.09
	μ Leonis	W.	11	9 43 49.80	0.62	0.13	+ 0.04	0.66	0.08	48.35	9 45 40.61	52.26	+ 0.24
	α Leonis	W.	11	9 59 52.91	0.57	0.12	— 0.02	0.61	0.09	51.50	10 1 44.10	52.60	— 0.10
	32 Ursæ Majoris	W.	11	10 7 9.68	0.90	0.18	+ 0.39	1.44	0.10	7.45	10 8 59.93	[52.48]	.....
	γ^1 Leonis	W.	9	10 11 15.04	0.59	0.12	0.10	0.63	0.10	13.70	10 13 6.09	52.39	+ 0.11
	9 Draconis	W.	3	10 22 41.90	— 1.24	— 0.24	+ 0.77	— 2.51	— 0.10	38.58	10 24 31.83	[+1 53.25]	.....

$a' = + 0^s.023$ (circle E.); $a'' = - 0^s.214$ (circle W.); $c = 0^s.574$ (+ with circle E.).
Chronometer No. 1295 at $7^h\ 20^m$ *slow* $1^m\ 52^s.50 \pm 0^s.020$, *gaining* $0^s.034$ per hour.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Jan. 29	48 Cephei	E.	11	3 2 36.48	+ 1.27	— 0.48	— 0.09	+ 0.62	0.00	37.80	3 4 31.15	[+1 53.35]	.....
	α Persei	E.	10	3 13 30.71	0.74	0.39	0.02	0.21	0.00	31.25	3 15 24.32	53.07	— 0.21
	δ Persei	E.	11	3 32 8.51	0.71	0.22	— 0.02	0.20	0.00	9.18	3 34 1.89	52.71	+ 0.15
	η Tauri	E.	11	3 38 10.38	0.59	0.35	0.00	0.15	0.00	10.77	3 40 3.62	52.85	+ 0.01
	ζ Persei	E.	11	3 44 23.60	0.63	0.35	— 0.01	0.16	0.00	24.03	3 46 16.92	52.89	— 0.03
	γ^1 Eridani	E.	11	3 50 19.03	0.49	0.27	+ 0.01	0.14	0.00	19.40	3 52 12.42	53.02	— 0.16
	γ Tauri	E.	10	4 10 48.09	0.58	0.27	+ 0.02	0.14	0.00	48.56	4 12 41.36	52.80	+ 0.06
	ϵ Tauri	E.	11	4 19 26.40	0.59	0.26	0.00	0.15	0.00	26.88	4 21 19.65	52.77	0.09
	α Tauri	E.	11	4 26 52.25	0.58	0.23	0.00	0.14	0.00	52.74	4 28 45.53	52.79	+ 0.07
	9 Camelopardalis	E.	11	4 39 45.55	+ 0.94	— 0.40	— 0.04	+ 0.33	0.00	46.38	4 41 39.28	[52.90]	.....
	ϵ Ursæ Minoris, S. P.	E.	11	4 56 54.09	— 0.74	+ 0.24	+ 0.17	— 1.00	0.00	52.76	16 58 45.52	[52.76]	.....
	β Tauri	E.	10	5 16 30.95	+ 0.63	— 0.23	0.00	+ 0.20	0.00	31.55	5 18 24.34	52.79	+ 0.07
	ϵ Orionis	W.	11	5 28 1.16	— 0.53	0.27	+ 0.16	— 0.18	0.00	0.34	5 29 53.15	52.81	+ 0.05
	α Orionis	W.	11	5 46 33.26	0.56	0.33	+ 0.09	0.18	0.00	32.28	5 48 25.25	52.97	— 0.11
	22 Camelopardalis	W.	11	6 3 17.23	0.90	0.45	— 1.06	0.50	0.00	14.23	6 5 6.88	[52.65]	.....
	μ Geminorum	W.	11	6 13 33.35	0.60	0.29	— 0.04	0.19	0.00	32.23	6 15 25.05	52.82	+ 0.04
	γ Geminorum	W.	11	6 28 38.82	0.58	0.30	+ 0.01	0.18	0.00	37.77	6 30 30.61	52.84	+ 0.02
	51 Cephei	W.	7	6 40 6.74	4.15	2.66	— 9.28	3.66	0.00	46.99	6 41 40.44	[53.45]	.....
	ϕ Geminorum	W.	9	7 44 0.67	— 0.62	— 0.34	— 0.09	— 0.19	+ 0.01	59.44	7 45 52.24	+ 1 52.80	+ 0.06

$a' = + 0^s.024$ (circle E.); $a'' = + 0^s.478$ (circle W.); $c = 0^s.156$ (+ with circle E.).
Chronometer No. 1295 at $4^h\ 49^m$ *slow* $1^m\ 52^s.86 \pm 0^s.017$, *losing* $0^s.026$ per hour.

Transits of stars observed at Aspinwall (Colon), United States of Colombia, by Miles Rock, esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Jan. 28	γ Tauri	E.	9	4 22 56.82	+ 0.57	+ 0.04	— 0.02	— 0.02	+ 0.08	57.47	4 12 41.37	— 10 16.10	+ 0.05
	ε Tauri	E.	11	4 31 35.06	0.57	0.04	0.04	0.02	0.08	35.69	4 21 19.66	16.03	— 0.02
	Aldebaran	E.	11	4 39 0.80	0.57	0.08	0.03	0.02	0.07	1.47	4 28 45.54	15.93	— 0.12
	9 Camelopard., U. C.	E.	11	4 51 55.05	+ 0.74	+ 0.20	— 0.46	— 0.04	+ 0.07	55.56	4 41 39.46	— 10 [16.10]	.....
	11 Orionis	E.	6	5 7 41.79	+ 0.57	+ 0.08	— 0.10	— 0.02	+ 0.06	42.38	4 57 26.38	— 10 16.00	— 0.05
	β Tauri	E.	10	5 28 40.15	0.59	0.15	0.34	0.02	0.05	40.58	5 18 24.35	16.23	+ 0.18
	Groom. 966, U. C	E.	5	5 33 22.92	+ 0.88	0.25	3.25	0.06	0.05	20.79	5 23 4.70	[16.09]	.....
	Groom. 966, U. C	W.	3	5 33 24.53	— 0.88	0.24	— 3.25	0.10	0.05	20.59	5 23 4.70	[15.89]	.....
	ε Orionis	W.	11	5 40 9.47	0.54	0.09	+ 0.17	0.02	0.04	9.21	5 29 53.16	16.05	0.00
	α Orionis	W.	5	5 58 41.66	0.55	0.12	+ 0.03	0.02	0.04	41.28	5 48 25.26	16.02	— 0.03
	22 Camelopard., U. C.	W.	10	6 15 26.10	— 0.78	+ 0.23	— 2.27	— 0.07	+ 0.03	23.24	6 5 6.90	— 10 [16.34]	.....
	α Geminorum	W.	11	7 36 55.89	— 0.60	+ 0.07	— 0.35	— 0.03	— 0.01	54.97	7 26 38.87	— 10 16.10	+ 0.05
	Procyon	W.	11	7 43 3.03	0.55	0.10	+ 0.05	0.02	0.01	2.60	7 32 46.69	15.91	— 0.14
	β Geminorum	W.	4	7 47 58.29	0.59	0.13	— 0.28	0.03	0.01	57.51	7 37 41.41	16.10	+ 0.05
	φ Geminorum	W.	11	7 56 9.19	0.59	0.05	0.26	0.03	0.02	8.34	7 45 52.23	16.11	+ 0.06
	3 Ursæ Majoris, U. C.	W.	6	8 10 43.74	0.77	0.07	— 1.84	0.07	0.02	41.11	8 0 25.23	[15.88]	.....
	ε Hydræ	W.	11	8 50 27.19	0.55	0.04	+ 0.03	0.03	0.04	26.64	8 40 10.66	15.98	+ 0.07
	ι Ursæ Majoris	W.	10	9 0 58.26	0.64	0.06	— 0.74	0.04	0.05	56.85	8 50 40.76	16.09	+ 0.04
	σ^3 Ursæ Majoris, U. C.	W.	6	9 9 45.16	— 0.76	+ 0.08	— 1.73	— 0.07	— 0.05	42.63	8 59 26.33	— 10 [16.30]	.....

$a_1 = +0^s.222$ (circle E., to 9 Camelop.); $a_2 = +0.925$ (circle E. and W., 1st group to 22 Camelop.); $a_3 = +0^s.772$ (circle W., 2d group); $c = +0.005$ (circle E.).

Chronometer No. 1254 at $7^h\ 20^m$ *fast* $10^m\ 16^s.06 \pm 0^s.016$, *gaining* $0^s.027$ per hour.

1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Jan. 29	γ Tauri	E.	9	4 22 56.85	+ 0.57	+ 0.03	— 0.03	— 0.02	+ 0.16	57.56	4 12 41.36	— 10 16.20	— 0.07
	ε Tauri	E.	11	4 31 35.26	0.57	0.04	0.05	0.02	0.15	35.95	4 21 19.65	16.30	+ 0.03
	Aldebaran	E.	11	4 39 1.02	0.57	0.05	0.04	0.02	0.14	1.72	4 28 45.53	16.19	— 0.08
	9 Camelopard., U. C.	E.	4	4 51 55.32	0.74	0.14	0.60	0.05	0.13	55.68	4 41 39.43	[16.25]	.....
	ι Aurigæ	E.	10	4 59 7.59	0.60	+ 0.11	0.14	0.02	0.12	8.26	4 48 51.99	16.27	0.00
	11 Orionis	E.	11	5 7 42.00	0.57	0.00	— 0.03	0.02	0.12	42.64	4 57 26.37	16.27	0.00
	β Orionis	E.	8	5 18 48.28	0.53	0.00	+ 0.09	0.02	0.11	48.99	5 8 32.69	16.30	+ 0.03
	β Tauri	E.	10	5 28 40.18	0.59	— 0.01	— 0.11	0.02	0.10	40.73	5 18 24.34	16.39	+ 0.12
	Groom. 966, U. C	E.	6	5 33 21.15	+ 0.88	— 0.05	— 1.01	— 0.08	+ 0.09	20.98	5 23 4.66	— 10 [16.32]	.....
	Groom. 966, U. C	W.	3	5 33 21.86	— 0.88	+ 0.16	— 0.30	— 0.07	+ 0.09	20.86	5 23 4.66	— 10 [16.20]	.....
	ε Orionis	W.	11	5 40 9.83	0.54	0.08	+ 0.02	0.02	0.08	9.45	5 29 53.15	16.30	+ 0.03
	α Orionis	W.	10	5 58 41.87	0.54	0.17	0.00	0.02	0.07	41.55	5 48 25.25	16.30	+ 0.03
	22 Camelopard., U. C.	W.	7	6 15 24.04	0.78	0.25	— 0.21	0.05	0.05	23.30	6 5 6.88	[16.42]	.....
	μ Geminorum	W.	10	6 25 41.68	— 0.58	+ 0.18	— 0.02	— 0.02	+ 0.04	41.28	6 15 25.05	— 10 16.23	— 0.04
	α Geminorum	W.	10	7 36 55.57	— 0.60	+ 0.24	0.00	— 0.02	— 0.02	55.17	7 26 38.87	— 10 16.30	+ 0.03
	Procyon	W.	11	7 43 3.36	0.55	0.22	0.00	0.02	0.03	2.98	7 32 46.69	16.29	0.02
	β Geminorum	W.	10	7 47 58.14	0.59	0.26	0.00	0.02	0.04	57.75	7 37 41.41	16.33	+ 0.06
	3 Ursæ Majoris, U. C.	W.	10	8 10 42.28	0.77	0.17	— 0.01	0.05	0.06	41.56	8 0 25.24	[16.32]	.....
	ε Hydræ	W.	11	8 50 27.42	0.55	0.07	0.00	0.02	0.10	26.82	8 40 10.67	16.15	— 0.12
	ι Ursæ Majoris	W.	10	9 0 57.76	0.64	0.09	0.00	0.03	0.10	57.08	8 50 40.78	16.30	+ 0.03
	σ^3 Ursæ Majoris, U. C.	W.	4	9 9 43.46	— 0.76	+ 0.11	— 0.01	— 0.05	— 0.11	42.64	8 59 26.35	10 [16.29]	.....

$a_1 = +0^s.289$ (circle E.); $a_2 = +0^s.085$ (circle W., 1st group to μ Geminorum); $a_3 = +0^s.003$ (circle W., 2d group); $c = -0^s.001$ (circle E.)

Chronometer No. 1254 at $7^h\ 10^m$ *fast* $10^m\ 16^s.27 \pm 0^s.010$, *gaining* $0^s.057$ per hour.

Transits of stars observed at Santiago de Cuba, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Feb. 23	δ Orionis	E.	11	5 20 8.61	+ 0.47	+ 0.06	+ 0.30	− 0.20	+ 0.09	9.33	5 25 37.84	+ 5 28.51	+ 0.09
	ϵ Orionis	E.	11	5 24 23.39	0.47	0.07	0.31	0.20	0.08	24.12	5 29 52.86	28.74	− 0.14
	α Orionis	E.	11	5 42 55.70	0.49	0.12	+ 0.19	0.20	0.08	56.38	5 48 24.98	28.60	0.00
	22 Camelopardalis	E.	11	5 59 38.46	+ 0.92	+ 0.18	− 1.86	− 0.56	0.07	37.21	6 5 6.04	[28.83]	.....
	δ Ursæ Minoris, S. P.	E.	6	6 6 42.39	− 2.41	− 0.04	+13.93	+ 3.30	0.06	57.23	18 12 26.90	[29.67]	.....
	γ Geminorum	E.	11	6 25 1.31	+ 0.52	+ 0.08	+ 0.05	− 0.20	0.06	1.82	6 30 30.42	28.60	0.00
	51 Cephei	E.	7	6 36 19.50	4.02	1.01	−16.51	4.07	0.05	4.00	6 41 34.42	[30.42]	.....
	δ Geminorum	E.	11	7 7 11.56	0.54	0.14	0.04	0.21	0.04	12.03	7 12 40.63	28.60	0.00
	α Geminorum	E.	11	7 21 9.83	0.58	0.13	− 0.22	0.23	0.03	10.12	7 26 38.78	28.66	− 0.06
	α Canis Minoris	E.	11	7 27 17.36	0.49	0.16	+ 0.22	0.20	0.03	18.06	7 32 46.61	28.55	+ 0.05
	β Geminorum	E.	11	7 32 12.40	0.56	0.13	− 0.14	0.22	0.03	12.81	7 37 41.35	28.54	+ 0.06
	3 Ursæ Majoris	E.	3	7 54 57.47	+ 0.91	+ 0.28	− 1.80	− 0.55	+ 0.02	56.33	8 0 25.05	[28.72]	.....
	α Leonis	W.	11	9 56 16.13	− 0.51	− 0.07	+ 0.15	+ 0.16	− 0.03	15.83	10 1 44.41	28.58	+ 0.02
	γ^1 Leonis	W.	11	10 7 38.38	0.53	+ 0.03	− 0.01	0.17	0.04	38.00	10 13 6.45	28.45	+ 0.15
	9 Draconis	W.	11	10 19 7.68	1.17	+ 0.13	− 4.15	0.67	0.04	3.12	10 24 32.86	[29.74]	.....
	l Leonis	W.	11	10 37 14.30	0.50	0.00	+ 0.18	0.16	0.05	14.09	10 42 42.72	28.63	− 0.03
	δ Leonis	W.	11	11 2 1.02	− 0.54	+ 0.01	− 0.04	+ 0.17	− 0.06	0.56	11 7 29.25	+ 5 28.69	− 0.09

$a' = +0^s.862$ (circle E.); $a'' = +1^s.175$ (circle W.); $c = 0^s.176$ (+ with circle W.).
Chronometer No. 1295 at $8^h\ 36^m$ *slow* $5^m\ 28^s.60 \pm 0^s.015$, *gaining* $0^s.026$ per hour.

1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Feb. 24	ϵ Ursæ Minoris, S. P.	E.	11	4 53 18.64	− 0.78	0.00	+ 1.84	+ 2.62	+ 0.27	22.59	16 58 49.83	[+5 27.24]	.....
	β Orionis	E.	10	5 3 3.72	+ 0.44	+ 0.06	+ 0.12	− 0.36	0.25	4.23	5 8 32.33	28.10	+ 0.07
	Groombridge 966	E.	11	5 17 35.55	1.11	− 0.02	− 0.80	1.37	0.24	34.71	5 23 3.14	[28.43]	.....
	ϵ Orionis	E.	9	5 24 24.18	0.47	+ 0.02	+ 0.09	0.35	0.23	24.64	5 29 52.84	28.20	− 0.03
	α Orionis	E.	11	5 42 56.31	0.49	− 0.02	+ 0.06	0.36	0.21	56.69	5 48 24.97	28.28	− 0.11
	22 Camelopardalis	E.	7	5 59 38.41	+ 0.92	+ 0.07	− 0.55	− 1.01	0.19	38.03	6 5 5.99	[27.96]	.....
	δ Ursæ Minoris, S. P.	E.	7	6 6 50.66	− 2.41	− 0.18	+ 4.10	+ 5.96	0.18	58.31	18 12 27.24	[28.93]	.....
	γ Geminorum	E.	11	6 25 1.88	+ 0.52	+ 0.03	+ 0.02	− 0.37	0.16	2.24	6 30 30.40	28.16	+ 0.01
	51 Cephei	E.	7	6 36 12.36	4.02	0.22	− 4.87	7.35	0.14	4.52	6 41 34.03	[29.51]	.....
	ϵ Canis Majoris	E.	11	6 48 15.40	0.38	0.02	+ 0.22	0.40	0.13	15.75	6 53 43.82	28.07	+ 0.10
	δ Geminorum	E.	11	7 7 12.13	0.54	0.06	− 0.01	0.38	0.11	12.45	7 12 40.62	28.17	0.00
	α Geminorum	E.	11	7 21 10.20	0.58	0.12	− 0.06	0.41	0.09	10.52	7 26 38.77	28.25	− 0.08
	α Canis Minoris	E.	11	7 27 18.06	0.49	0.07	+ 0.06	0.36	0.08	18.40	7 32 46.60	28.20	0.03
	β Geminorum	E.	11	7 32 12.89	0.56	0.04	− 0.04	0.40	0.08	13.13	7 37 41.34	28.21	− 0.04
	3 Ursæ Majoris	E.	3	7 54 57.35	+ 0.91	0.17	0.53	− 0.99	0.05	56.96	8 0 25.02	[28.06]	.....
	3 Ursæ Majoris	W.	3	7 54 58.15	− 0.91	0.37	2.11	+ 0.87	+ 0.05	56.42	8 0 25.02	[28.60]	.....
	1 Draconis	W.	7	9 13 55.15	1.67	+ 0.71	6.33	2.22	− 0.04	50.04	9 19 18.20	[28.16]	.....
	ϵ Leonis	W.	11	9 33 19.20	0.55	− 0.07	0.08	0.35	0.07	18.78	9 38 46.97	28.19	− 0.02
	μ Leonis	W.	11	9 40 13.28	0.56	+ 0.02	− 0.13	0.35	0.08	12.88	9 45 40.91	28.03	+ 0.14
	α Leonis	W.	11	9 56 16.43	0.51	− 0.07	+ 0.13	0.32	0.09	16.21	10 1 44.41	28.20	− 0.03
	γ^1 Leonis	W.	11	10 7 38.67	0.53	+ 0.07	− 0.01	0.34	0.11	38.43	10 13 6.46	28.03	+ 0.14
	ρ Leonis	W.	11	10 20 47.15	0.50	0.01	+ 0.18	0.32	0.12	47.04	10 26 15.27	28.23	− 0.06
	l Leonis	W.	11	10 37 14.52	− 0.50	+ 0.10	+ 0.16	+ 0.32	− 0.14	14.46	10 42 42.73	+5 28.27	− 0.10

$a' = +0^s.254$ (circle E.); $a'' = +1^s.014$ (circle W.); $c = 0^s.334$ (+ with circle W.).
Chronometer No. 1295 at $8^h\ 35^m$ *slow* $5^m\ 28^s.17 \pm 0^s.014$, *gaining* $0^s.072$ per hour.

Transits of stars observed at Kingston, Jamaica, by Miles Rock, esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Feb. 23	Piazzi VII, 67, U. C.	W.	11	7 15 14.05	— 0.94	+ 0.05	— 4.63	+ 1.05	— 0.21	9.37	7 17 54.81	+2 [45.44]	.....
	α Geminorum.....	W.	11	7 23 54.37	0.62	0.03	— 0.63	0.45	0.19	53.41	7 26 38.78	45.37	— 0.12
	Procyon.....	W.	10	7 30 1.14	0.53	0.03	+ 0.47	0.38	0.17	1.32	7 32 46.60	45.28	— 0.03
	β Geminorum.....	W.	11	7 34 56.86	0.60	0.03	— 0.44	0.43	0.16	56.12	7 37 41.35	45.23	+ 0.02
	ϕ Geminorum.....	W.	9	7 43 7.63	— 0.60	+ 0.03	— 0.39	+ 0.43	0.14	6.96	7 45 52.19	45.23	+ 0.02
	λ Ursæ Minoris, L. C.	W.	2	7 43 41.02	+ 9.40	— 0.35	+109.30	—22.42	0.12	136.83	19 48 4.28	[47.45]	.....
	3 Ursæ Majoris, U. C.	W.	8	7 57 44.21	— 0.94	+ 0.05	— 4.67	+ 1.05	— 0.12	39.58	8 0 25.03	+2 [45.45]	.....
	1 Draconis, U. C	W.	5	9 16 44.59	— 1.68	— 0.12	— 12.16	+ 2.69	+ 0.11	33.43	9 19 18.19	+2 [44.76]	.....
	α Hydræ	W.	11	9 18 42.09	0.49	0.04	+ 0.85	0.38	0.12	42.91	9 21 28.03	45.12	+ 0.13
	ε Leonis.....	W.	9	9 36 2.02	0.59	0.05	— 0.23	0.42	0.16	1.63	9 38 46.96	45.33	— 0.08
	μ Leonis.....	W.	11	9 42 56.13	0.60	0.07	— 0.32	0.43	0.18	55.75	9 45 40.90	45.15	+ 0.10
	Regulus.....	W.	11	9 58 59.01	0.55	0.06	+ 0.18	0.39	0.22	59.19	10 1 44.40	45.21	+ 0.04
	32 Ursæ Majoris, U. C.	W.	11	10 6 18.46	0.88	0.15	— 3.44	0.93	0.25	15.17	10 9 0.52	[45.35]	.....
	γ¹ Leonis.....	W.	11	10 10 21.46	0.58	0.07	0.09	0.40	0.25	21.37	10 13 6.44	45.07	+ 0.18
	9 Draconis, U. C	W.	3	10 21 53.44	— 1.20	— 0.22	— 6.90	+ 1.61	+ 0.28	47.01	10 24 32.84	+2 [45.83]	.....
	9 Draconis, U. C	E.	2	10 21 50.48	+ 1.20	+ 0.18	— 2.65	— 1.78	+ 0.29	46.73	10 24 32.84	+2 [46.11]	.....
	l Leonis.....	E.	11	10 39 56.76	0.55	0.06	+ 0.09	0.43	0.33	57.36	10 42 42.71	45.35	— 0.10
	α Ursæ Majoris.....	E.	11	10 53 19.22	0 83	0.09	— 1.11	0.91	0.37	18.49	10 56 3.79	45.30	0.05
	δ Leonis.....	E.	11	11 4 43.37	0.58	0.05	— 0.04	0.45	0.40	43.91	11 7 29.24	45.33	0.08
	δ Crateris.....	E.	11	11 10 20.62	+ 0.47	+ 0.04	+ 0.40	— 0.43	+ 0.41	21.51	11 13 6.82	+2 45.31	— 0.06

$a_1 = +\ 2^s.168$ (circle W., 1st group to 3 Urs. Maj.); $a_2 = +\ 1^s.913$ (circle W., 2d group); $a_3 = +\ 0^s.733$ (circle E.); $c = -\ 0^s.400$ (circle E.).
Chronometer No. 1254 at $8^h\ 34^m$ *slow* $2^m\ 45^s.25 \pm 0^s.017$, *losing* $0^s.159$ per hour.

1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Feb. 24	ε Orionis	E.	11	5 27 3.96	+ 0.51	+ 0.04	+ 0.50	— 0.56	— 0.32	4.13	5 23 52.84	+2 48.71	— 0.04
	α Orionis.....	E.	11	5 45 36.27	0.51	0.09	+ 0.28	0.56	0.29	36.33	5 48 24.97	48.64	+ 0.03
	22 Camelopard., U. C..	E.	10	6 2 21.48	+ 0.96	+ 0.12	— 3.34	— 1.58	0.26	17.38	6 5 5.99	[48.61]	.....
	δ Ursæ Minoris, L. C.	E.	5	6 9 9.99	— 3.32	— 0.93	+23.68	+ 9.38	0.25	38.55	18 12 27.24	[48.69]	.....
	μ Geminorum.....	E.	9	6 12 36.39	+ 0.58	+ 0.09	— 0.13	— 0.60	0.24	36.09	6 15 24.81	48.72	— 0.05
	γ Geminorum.....	E.	11	6 27 41.87	+ 0.56	+ 0.04	+ 0.04	— 0.58	— 0.22	41.71	6 30 30.40	+2 48.69	— 0.02
	δ Geminorum.....	W.	11	7 9 52.30	— 0.58	— 0.15	— 0.07	+ 0.56	— 0.14	51.92	7 12 40.62	+2 48.70	— 0.03
	α Geminorum.....	W.	11	7 23 50.44	0.62	0.11	— 0.24	0.61	0.12	49.96	7 26 38.77	48.81	— 0.14
	Procyon	W.	11	7 29 58.11	0.53	0.09	+ 0.18	0.52	0.11	58.08	7 32 46.59	48.51	+ 0.16
	β Geminorum	W.	11	7 34 52.92	0.60	0.09	— 0.17	0.59	0.10	52.55	7 37 41.34	48.79	— 0.19
	ϕ Geminorum.....	W.	11	7 43 3.92	— 0.60	— 0.09	— 0.15	+ 0.58	0.09	3.57	7 45 52.18	48.61	+ 0.06
	λ Ursæ Minoris, L. C.	W.	3	7 44 55.02	+ 9.40	+ 1.23	+41.79	—27.52	0.07	79.84	19 48 5.06	[45.22]	.....
	3 Ursæ Majoris, U. C.	W.	8	7 57 37.24	— 0.94	— 0.17	— 1.78	+ 1.43	— 0.06	35.72	8 0 25.01	+2 [49.29]	.....
	κ Cancri	W.	7	8 58 11.40	— 0.55	— 0.14	+ 0.08	+ 0.53	+ 0.04	11.36	9 1 0.00	+2 48.64	+ 0.03
	1 Draconis, U. C	W.	5	9 16 31.69	1.68	0.25	— 3.96	3.65	0.07	29.52	9 19 18.17	[48.65]	.....
	α Hydræ	W.	11	9 19 39.15	0.49	0.05	+ 0.28	0.52	0.08	39.49	9 21 28.03	48.54	+ 0.13
	μ Leonis.....	W.	11	9 42 52.19	0.60	0.07	— 0.10	0.58	0.12	52.12	9 45 40.90	48.78	— 0.11
	α Leonis.....	W.	11	9 58 55.67	0.55	0.10	+ 0.06	0.53	0.15	55.76	10 1 44.41	48.65	+ 0.02
	32 Ursæ Majoris, U. C.	W.	10	10 6 12.50	0.88	0.15	— 1.12	1.95	0.16	11.76	10 9 0.53	[48.77]	.....
	γ¹ Leonis	W.	11	10 10 17.81	—0.58	— 0.07	— 0.03	+ 0.55	+ 0.17	17.85	10 13 6.45	+2 48.60	+ 0.07

$a_1 = +\ 1^s.503$ (circle E.); $a_2 = +\ 0^s.839$ (circle W., 1st group to 3 Urs. Maj.); $a_3 = +\ 0^s.624$ (circle W., 2d group); $c = -\ 0^s.536$ (circle E.).
Chronometer No. 1254 at $6^h\ 44^m$ *slow* $2^m\ 48^s.67 \pm 0^s.018$, *losing* $0^s.104$ per hour.

Transits of stars observed at Santiago de Cuba, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Feb. 25	22 Camelopardalis	W.	6	5 59 38.60	− 0.92	+ 0.06	− 0.29	+ 0.59	+ 0.05	38.09	6 5 5.95	[+5 27.86]	.....
	ε Canis Majoris.....	W.	11	6 48 15.99	0.38	0.01	+ 0.12	0.24	0.03	16.01	6 53 43.80	27.79	− 0.01
	δ Canis Majoris.....	W.	11	6 57 51.84	0.39	0.02	+ 0.11	0.23	0.03	51.84	7 3 19.55	27.71	+ 0.07
	δ Geminorum.....	W.	10	7 7 12.96	0.54	0.03	− 0.01	0.23	0.03	12.70	7 12 40.61	27.91	− 0.13
	Piazzi VII, 67.....	W.	11	7 12 26.41	0.91	0.09	0.28	0.57	0.02	25.90	7 17 54.76	[28.86]	.....
	α Geminorum.....	W.	11	7 21 11.09	0.58	0.10	− 0.03	0.25	0.02	10.85	7 26 38.76	27.91	− 0.13
	α Canis Minoris.....	W.	11	7 27 19.01	0.49	0.09	+ 0.03	0.21	0.02	18.87	7 32 46.59	27.72	+ 0.06
	β Geminorum.....	W.	11	7 32 13.73	0.56	0.15	+ 0.02	0.24	0.02	13.60	7 37 41.33	27.73	0.05
	φ Geminorum.....	W.	11	7 40 24.65	− 0.56	0.15	− 0.02	+ 0.24	+ 0.01	24.47	7 45 52.18	27.71	+ 0.07
	κ Cancri	E.	11	8 55 31.68	+ 0.50	0.14	+ 0.03	− 0.25	− 0.01	32.09	9 1 0.00	27.91	− 0.13
	1 Draconis	E.	11	9 13 51.20	1.67	0.39	− 1.05	1.76	0.02	50.43	9 19 18.18	[27.75]	.....
	ε Leonis	E.	11	9 33 18.78	0.55	0.11	0.01	0.27	0.02	19.14	9 38 46.97	27.83	− 0.05
	μ Leonis	E.	11	9 40 13.00	0.56	0.18	− 0.02	0.28	0.03	13.41	9 45 40.91	27.50	+ 0.28
	α Leonis	E.	11	9 56 16.29	0.51	0.07	+ 0.02	0.25	0.03	16.61	10 1 44.41	27.80	− 0.02
	γ Leonis	E.	11	10 7 38.29	0.53	0.13	0.00	0.27	0.03	38.65	10 13 6.47	27.82	0.04
	ρ Leonis	E.	11	10 20 47.06	+ 0.50	+ 0.16	+ 0.03	− 0.25	− 0.04	47.46	10 26 15.28	+ 5 27.82	− 0.04

$a' = +0^s.134$ (circle W.); $a'' = +0^s.168$ (circle E.); $c = 0^s.239$ (+ with circle W.).
Chronometer No. 1295 at $8^h\ 25^m$ *slow* $5^m\ 27^s.78 \pm 0^s.022$, *gaining* $0^s.020$ per hour.

1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Feb. 28	ε Canis Majoris.....	W.	11	6 48 18.54	− 0.44	+ 0.05	− 0.85	+ 0.09	+ 0.03	17.42	6 53 43.75	+ 5 26.33	− 0.16
	δ Canis Majoris.....	W.	11	6 57 54.52	0.45	0.05	− 0.79	0.09	0.03	53.45	7 3 19.50	26.05	+ 0.12
	δ Geminorum.....	W.	11	7 7 15.00	0.64	0.07	+ 0.04	0.09	0.03	14.59	7 12 40.58	25.99	+ 0.18
	Piazzi VII, 67.....	W.	11	7 12 27.00	1.07	0.11	2.05	0.21	0.03	28.33	7 17 54.66	[26.33]	.....
	α Geminorum.....	W.	5	7 21 12.88	0.68	0.07	+ 0.25	0.10	0.02	12.64	7 26 38.73	26.09	+ 0.08
	α Canis Minoris	W.	11	7 27 21.06	0.57	0.12	− 0.25	0.08	0.02	20.46	7 32 46.56	26.10	0.07
	β Geminorum.....	W.	11	7 32 15.37	0.66	0.17	+ 0.16	0.09	0.02	15.15	7 37 41.30	26.15	0.02
	φ Geminorum.....	W.	4	7 40 26.33	− 0.66	+ 0.14	+ 0.14	+ 0.09	+ 0.02	26.06	7 45 52.15	26.09	+ 0.08
	1 Draconis.....	E.	6	9 13 51.06	+ 1.97	− 0.05	− 0.02	− 0.85	− 0.01	52.10	9 19 18.09	[25.99]	.....
	ε Leonis	E.	11	9 33 20.16	0.64	+ 0.02	0.00	0.13	− 0.01	20.68	9 38 46.98	26.30	− 0.13
	μ Leonis	E.	11	9 40 14.24	0.65	+ 0.01	0.00	0.13	0.02	14.75	9 45 40.92	26.17	0.00
	α Leonis	E.	11	9 56 17.77	0.60	0.00	0.00	0.12	0.02	18.23	10 1 44.43	26.20	− 0.03
	32 Ursæ Majoris	E.	11	10 3 33.50	1.00	+ 0.05	− 0.01	0.29	0.02	34.23	10 9 0.56	[26.33]	.....
	ρ Leonis	E.	11	10 20 48.51	0.59	0.02	0.00	0.12	0.03	48.97	10 26 15.30	26.33	− 0.16
	l Leonis	E.	11	10 37 15.95	0.60	0.06	0.00	0.12	0.03	16.46	10 42 42.76	26.30	0.13
	α Ursæ Majoris	E.	11	10 50 36.55	0.94	0.10	− 0.01	0.26	0.03	37.29	10 56 3.91	26.62	0.45
	δ Leonis	E.	11	11 2 2.57	0.63	0.10	0.00	0.13	0.04	3.13	11 7 29.31	26.18	− 0.01
	δ Crateris	E.	11	11 7 40.49	0.50	0.05	0.00	0.13	0.04	40.87	11 13 6.88	26.01	+ 0.16
	τ Leonis	E.	10	11 16 5.50	0.57	0.13	0.00	0.12	0.04	6.04	11 21 32.04	26.00	0.17
	υ Leonis	E.	11	11 25 7.78	0.55	0.04	0.00	0.12	0.04	8.21	11 30 34.37	26.16	+ 0.01
	β Leonis	E.	11	11 37 15.78	0.61	0.10	0.00	0.12	0.05	16.32	11 42 42.59	26.27	− 0.10
	γ Ursæ Majoris	E.	11	11 41 51.24	0.84	0.13	− 0.25	0.20	0.05	51.71	11 47 18.03	26.32	− 0.15
	o Virginis	E.	11	11 53 25.29	0.59	0.09	+ 0.05	0.12	0.05	25.85	11 58 52.00	26.15	+ 0.02
	4 Draconis.....	E.	4	12 1 1.67	+ 1.53	+ 0.53	− 1.09	− 0.59	− 0.05	2.00	12 6 28.16	[+5 26.16]	.....

$a' = -0^s.993$ (circle W.); $a'' = +0^s.004$ (β Leonis et super circle E.); $a''' = +0^s.260$ (γ Urs. Maj. et sub circle E.); $c = 0^s.101$ (+ with circle W.).
Chronometer No. 1295 at $8^h\ 45^m$ *slo* $^m\ 26^s.17 \pm 0^s.019$, *gaining* $0^s.016$ per hour.

Transits of stars observed at Kingston, Jamaica, by Miles Rock, esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Feb. 25	α Orionis	E.	11	5 45 33.34	+ 0.54	− 0.10	− 0.58	− 0.28	− 0.35	32.57	5 48 24.95	+ 2 52.38	− 0.09
	δ Ursæ Minoris, L. C.	E.	5	6 9 83.99	− 3.32	+ 0.31	49.31	+ 4.72	0.30	36.09	18 12 27.57	[51.48]	.....
	Canopus	E.	11	6 18 24.88	+ 0.30	− 0.09	4.88	− 0.46	0.28	19.47	6 21 11.78	52.31	− 0.02
	γ Geminorum	E.	11	6 27 38.34	0.56	0.13	0.08	0.29	0.26	38.14	6 30 30.39	52.25	+ 0.04
	51 Cephei, U. C	E.	3	6 37 43.83	+ 3.97	− 0.74	+ 60.92	− 5.82	0.25	101.91	6 41 33.66	+ 2 [51.75]	.....
	δ Canis Majoris	W.	11	7 0 30.39	− 0.43	+ 0.02	− 2.72	+ 0.27	0.19	27.34	7 3 19.55	+ 2 52.21	+ 0.08
	δ Geminorum	W.	11	7 9 48.53	0.58	0.03	+ 0.28	0.26	0.17	48.35	7 12 40.61	52.26	+ 0.03
	α Geminorum	W.	10	7 23 45.85	0.62	0.05	+ 1.02	0.28	0.13	46.45	7 26 38.76	52.31	− 0.02
	Procyon	W.	11	7 29 55.38	0.53	0.02	− 0.76	0.24	0.12	54.23	7 32 46.59	52.36	0.07
	β Geminorum	W.	11	7 34 43.72	0.60	0.02	+ 0.71	0.27	0.11	49.01	7 37 41.33	52.32	− 0.03
	φ Geminorum	W.	10	7 42 59.71	− 0.60	+ 0.02	+ 0.62	+ 0.27	0.09	59.93	7 45 52.17	52.24	+ 0.05
	λ Ursæ Minoris, L. C	W.	3	7 45 193.99	+ 9.40	− 0.35	−176.63	−12.80	0.07	13.54	19 48 5.84	[52.30]	.....
	3 Ursæ Majoris, U. C	W.	8	7 57 25.08	− 0.94	+ 0.09	+ 7.53	+ 0.66	− 0.06	32.36	8 0 24.99	+ 2 [52.63]	.....
	α Hydræ	W.	11	9 18 37.55	− 0.49	− 0.05	− 1.68	0.24	+ 0.12	35.69	9 21 28.03	+ 2 52.34	− 0.05
	d Ursæ Majoris, U. C	W.	7	9 20 27.77	0.98	0.09	+ 8.95	0.72	0.13	36.50	9 23 28.82	[52.32]	.....
	ε Leonis	W.	11	9 35 54.38	0.59	0.05	0.46	0.26	0.16	54.62	9 38 46.97	52.35	− 0.06
	μ Leonis	W.	11	9 42 48.23	0.60	0.06	0.64	0.27	0.18	48.66	9 45 40.91	52.25	+ 0.04
	Regulus	W.	11	9 58 52.64	0.55	0.08	− 0.36	0.25	0.21	52.11	10 1 44.41	52.30	− 0.01
	γ¹ Leonis	W.	11	10 10 14.22	0.58	0.13	+ 0.18	0.26	0.24	14.19	10 13 6.46	52.27	+ 0.02
	9 Draconis, U. C	W.	3	10 21 27.08	− 1.20	− 0.29	+ 13.68	+ 1.02	+ 0.26	40.55	10 24 32.87	+ 2 [52.32]	.....

$a_1 = -3^s.140$ (circle E.); $a_2 = -3^s.504$ (circle W., 1st group to 3 Urs. Maj.); $a_3 = -3^s.793$ (circle W., 2d group); $c = -0^s.260$ (circle E.).
Chronometer No. 1254 at $8^h\ 24^m$ *slow* $2^m\ 52^s.29 \pm 0^s.009$, *losing* $0^s.134$ per hour.

1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Feb. 28	α Orionis	E.	11	5 45 23.73	+ 0.54	− 0.16	− 0.55	− 0.55	− 0.36	22.65	5 48 24.91	+ 3 2.26	+ 0.08
	δ Ursæ Minoris, L. C.	E.	5	6 9 68.19	− 3.32	+ 0.61	46.35	+ 9.21	0.31	23.03	18 12 28.51	[0.48]	.....
	Canopus	E.	6	6 18 15.10	+ 0.30	− 0.11	4.59	− 0.90	0.29	9.51	6 21 11.69	2.18	+ 0.16
	γ Geminorum	E.	11	6 27 28.73	0.56	0.18	− 0.08	0.57	0.27	28.19	6 30 30.35	2.16	+ 0.18
	51 Cephei, U. C	E.	3	6 37 42.83	+ 3.97	− 0.67	+ 57.37	−11.34	− 0.26	91.90	6 41 32.66	+ 3 [0.76]	.....
	δ Canis Majoris	W.	11	7 0 19.52	− 0.43	− 0.13	− 2.29	+ 0.56	− 0.21	17.02	7 3 19.50	+ 3 2.48	− 0.14
	δ Geminorum	W.	11	7 9 38.27	0.58	0.18	+ 0.24	0.55	0.19	38.11	7 12 40.58	2.47	0.13
	α Geminorum	W.	11	7 23 35.76	0.62	0.13	+ 0.85	0.60	0.16	36.30	7 26 38.73	2.43	0.09
	Procyon	W.	11	7 29 45.05	0.53	0.14	− 0.64	0.51	0.15	44.10	7 32 46.56	2.46	0.12
	β Geminorum	W.	11	7 34 38.60	0.60	0.14	+ 0.60	0.57	0.14	38.89	7 37 41.30	2.41	− 0.07
	φ Geminorum	W.	8	7 42 49.64	− 0.60	− 0.15	+ 0.52	+ 0.57	0.12	49.86	7 45 52.15	2.29	+ 0.05
	λ Ursæ Minoris, L. C.	W.	3	7 45 168.99	+ 9.40	+ 2.61	−148.28	−26.98	0.11	5.63	19 48 7.94	[2.31]	.....
	3 Ursæ Majoris, U. C.	W.	8	7 57 15.50	− 0.94	− 0.21	+ 6.32	+ 1.40	− 0.09	21.95	8 0 21.92	+ 3 [2.97]	.....
	α Hydræ	W.	11	9 18 27.08	− 0.49	− 0.20	− 1.39	+ 0.51	+ 0.07	25.58	9 21 28.03	+ 3 2.45	− 0.11
	ε Leonis	W.	11	9 35 44.08	0.59	0.02	+ 0.38	0.56	0.11	44.52	9 38 46.98	2.46	− 0.12
	μ Leonis	W.	11	9 42 38.00	0.60	0.02	+ 0.52	0.57	0.12	38.59	9 45 40.92	2.33	+ 0.01
	Regulus	W.	11	9 58 42.51	0.55	0.08	− 0.30	0.52	0.15	42.28	10 1 44.43	2.15	+ 0.19
	32 Ursæ Majoris, U. C.	W.	7	10 5 52.22	0.83	0.16	+ 5.61	1.23	0.17	58.22	10 9 0.56	[2.34]	.....
	γ¹ Leonis	W.	11	10 10 4.02	0.58	0.05	0.15	0.51	0.18	4.26	10 13 6.48	2.22	+ 0.12
	9 Draconis, U. C	W.	3	10 21 18.48	− 1.20	− 0.22	+ 11.31	+ 2.14	+ 0.19	30.70	10 24 32.92	+ 3 [2.22]	.....

$a_1 = -2^s.952$ (circle E.); $a_2 = -2^s.942$ (circle W., 1st group to 3 Urs. Maj.); $a_3 = -3^s.132$ (circle W., 2d group); $c = -0^s.526$ (circle E.).
Chronometer No. 1254 at $8^h\ 43^m$ *slow* $3^m\ 2^s.33 \pm 0^s.022$, *losing* $0^s.122$ per hour.

Transits of stars observed at Havana, Cuba, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Mar. 19	ε Hydræ	E.	10	9 0 59.23	+ 0.52	− 0.04	− 0.32	+ 0.01	+ 0.08	59.48	8 40 10.57	−20 48.91	− 0.02
	ι Ursæ Majoris	E.	10	9 11 27.97	0.74	− 0.06	+ 0.76	+ 0.01	0.08	29.50	8 50 40.66	48.84	− 0.09
	κ Cancri	E.	11	9 21 48.63	0.54	0.00	− 0.25	0.00	0.07	48.99	9 0 59.88	49.11	+ 0.18
	1 Draconis	E.	4	9 39 56.62	+ 2.00	+ 0.23	+ 7.06	+ 0.04	0.06	6.01	9 19 16.93	[49.08]	.....
	1 Draconis	W.	5	9 39 52.95	− 2.00	+ 0.23	15.08	− 0.32	0.06	6.00	9 19 16.93	[49.07]	.....
	ε Leonis	W.	11	9 59 36.31	0.59	− 0.02	0.06	0.04	0.05	35.77	9 38 46.91	48.86	− 0.07
	μ Leonis	W.	11	10 6 30.25	− 0.60	+ 0.02	0.17	− 0.05	+ 0.05	29.84	9 45 40.86	48.98	+ 0.05
	4 Draconis	E.	4	12 27 6.84	+ 1.56	+ 0.02	+ 9.37	+ 0.02	− 0.04	17.77	12 6 28.76	[49.01]	.....
	η Virginis	E.	5	12 34 21.50	0.50	0.00	− 0.90	+ 0.01	0.04	21.07	12 13 32.25	48.82	− 0.11
	β Corvi	E.	10	12 48 41.61	+ 0.41	+ 0.02	1.79	− 0.30	0.03	39.90	12 27 50.84	49.06	+ 0.13
	Polaris, S. P.	E.	5	13 34 4.14	− 8.48	− 0.74	−90.41	+11.89	0.07	36.33	1 11 47.41	[48.92]	.....
	12 Canum Venat	E.	9	13 11 0.65	+ 0.67	+ 0.02	+ 0.82	− 0.36	0.06	1.80	12 50 13.05	48.75	− 0.18
	θ Virginis	E.	11	13 24 20.11	0.53	0.03	− 1.08	0.28	0.07	19.29	13 3 30.25	49.04	+ 0.11
	α Virginis	E.	11	13 39 28.18	+ 0.46	+ 0.05	− 1.30	− 0.29	− 0.08	27.02	13 18 38.03	−20 48.99	+ 0.06

$a' = -1^s.166$ (circle E.); $a'' = -2^s.490$ (circle W.); $a''' = -2^s.308$ (circle E.); $c_1 = +0^s.025$ (η Virginis et super); $c_2 = -0^s.261$ (β Corvi et sub).
Chronometer No. 1295 at $11^h\ 26^m$ *fast* $20^m\ 48^s.93 \pm 0^s.025$, *gaining* $0^s.035$ per hour.
Between η Virginis and β Corvi the collimation changed from cause unknown.

1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Mar. 20	λ Ursæ Minoris, S. P.	E.	7	8 9 29.62	−10.00	− 0.94	− 5.87	+10.24	− 0.05	16.00	19 48 24.59	[−20 51.41]	.....
	ε Hydræ	E.	11	9 0 59.64	+ 0.48	+ 0.05	− 0.03	− 0.19	0.04	59.91	8 40 10.56	20 49.35	− 0.03
	ι Ursæ Majoris	E.	11	9 11 29.61	0.68	+ 0.06	+ 0.08	0.29	0.03	30.11	8 50 40.64	49.47	+ 0.09
	κ Cancri	E.	11	9 21 49.04	0.50	− 0.01	− 0.02	0.20	0.03	49.28	9 0 59.87	49.41	+ 0.03
	1 Draconis	E.	10	9 40 5.87	1.84	0.11	+ 0.72	1.36	0.02	6.94	9 19 16.84	[50.10]	.....
	ε Leonis	E.	11	9 59 36.01	0.50	− 0.05	0.00	0.21	0.02	36.23	9 38 46.90	49.33	− 0.05
	μ Leonis	E.	11	10 6 29.91	0.56	+ 0.04	+ 0.01	0.21	0.01	30.30	9 45 40.85	49.45	+ 0.07
	α Leonis	E.	11	10 22 33.41	0.50	0.00	− 0.02	0.20	− 0.01	33.68	10 1 44.40	49.28	− 0.10
	9 Draconis	E.	3	10 45 20.78	+ 1.27	0.00	+ 0.40	− 0.81	0.00	21.64	10 24 32.69	[48.95]	.....
	α Ursæ Majoris	W.	11	11 16 51.93	− 0.84	− 0.13	+ 2.29	+ 0.33	+ 0.01	53.59	10 56 3.98	49.61	+ 0.23
	δ Leonis	W.	10	11 28 19.43	0.54	0.08	− 0.06	0.17	0.02	18.94	11 7 29.42	49.52	0.14
	δ Crateris	W.	11	11 33 57.72	0.41	− 0.06	1.04	0.16	0.02	56.39	11 13 6.99	49.40	0.02
	τ Leonis	W.	11	11 42 22.43	0.47	0.00	0.56	0.15	0.02	21.57	11 21 32.17	49.40	0.02
	υ Leonis	W.	11	11 51 24.79	0.46	0.00	0.66	0.15	0.02	23.84	11 30 34.52	49.32	− 0.06
	β Leonis	W.	11	12 3 32.79	0.51	0.00	− 0.24	0.16	0.03	32.23	11 42 42.77	49.46	+ 0.08
	γ Ursæ Majoris	W.	9	12 8 6.64	0.73	+ 0.01	+ 1.49	0.27	0.03	7.71	11 47 18.27	49.44	.....
	o Virginis	W.	11	12 9 42.23	0.49	− 0.01	− 0.40	0.15	0.03	41.51	11 58 52.21	49.30	− 0.08
	4 Draconis	W.	11	12 27 12.18	1.41	0.06	+ 6.76	0.75	0.04	18.26	12 6 28.77	[49.49]	.....
	η Virginis	W.	11	12 34 22.53	− 0.46	− 0.04	− 0.65	+ 0.15	0.04	21.57	12 13 32.26	49.31	− 0.07
	Polaris, S. P.	W.	9	13 33 40.59	+ 7.85	+ 1.24	−65.64	− 6.50	0.06	37.60	1 11 47.04	[50.56]	.....
	32 Camelopardalis	W.	10	13 9 7.77	− 2.36	− 0.37	+14.18	+ 1.49	+ 0.05	20.76	12 48 32.02	[−20 48.74]	.....

$a' = -0^s.119$ (circle E.); $a'' = -1^s.671$ (circle W.); $c = 0^s.173$ (+ with circle W.).
Chronometer No. 1295 at $10^h\ 45^m$ *fast* $20^m\ 49^s.38 \pm 0^s.015$, *losing* $0^s.021$ per hour.

Transits of stars observed at Santiago de Cuba, by Miles Rock, esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of stars.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Mar. 19	Procyon	E.	11	7 24 55.78	+ 0.53	− 0.05	− 0.04	− 0.44	− 0.39	55.39	7 32 46.32	+ 7 50.93	+ 0.27
	β Geminorum	E.	11	7 29 50.19	0.61	0.04	+ 0.03	0.50	0.38	49.91	7 37 41.04	51.13	0.07
	φ Geminorum	E.	11	7 38 1.11	+ 0.60	− 0.02	+ 0.02	− 0.50	0.37	0.84	7 45 51.91	51.07	+ 0.13
	λ Ursæ Minoris, L. C.	E.	3	7 40 27.33	− 9.33	0.00	− 8.21	+23.54	0.36	32.97	19 48 23.57	[50.60]	.....
	3 Ursæ Majoris, U.C.	E.	8	7 52 33.00	+ 0.98	0.00	+ 0.34	− 1.22	0.34	32.76	8 0 24.23	[51.47]	.....
	15 Argus	E.	11	7 54 24.61	+ 0.40	− 0.04	− 0.13	− 0.48	− 0.34	23.02	8 2 14.13	+ 7 51.11	+ 0.09
	ε Hydræ	W.	11	8 32 19.75	− 0.53	− 0.05	− 0.11	+ 0.41	− 0.28	19.19	8 40 10.57	+ 7 51.38	− 0.18
	ι Ursæ Majoris	W.	11	8 42 49.46	0.72	0.03	+ 0.34	0.61	0.26	49.40	8 50 40.66	51.26	− 0.06
	σ^2 Ursæ Majoris, U.C.	W.	5	8 51 34.24	0.96	0.07	+ 0.92	1.06	0.25	34.94	8 59 26.03	[51.09]	.....
	κ Cancri	W.	10	8 53 9.09	0.54	0.02	− 0.07	0.41	0.24	8.63	9 0 59 88	51.25	− 0.05
	1 Draconis, U. C	W.	11	9 11 21.95	1.80	− 0.07	+ 2.97	2.86	0.22	25.69	9 19 16.93	[51.24]	.....
	ε Leonis	W.	11	9 30 55.81	0.59	+ 0.02	0.04	0.44	0.18	55.54	9 38 46.91	51.37	− 0.17
	μ Leonis	W.	10	9 37 49.80	0.60	0.06	+ 0.06	0.45	0.17	49.60	9 45 40.86	51.26	0.06
	Regulus	W.	11	9 53 53.40	− 0.55	+ 0.05	− 0.06	0.41	− 0.15	53.10	10 1 44.40	+ 7 51.30	− 0.10
	β Corvi	W.	11	12 19 59.91	− 0.43	+ 0.05	− 0.80	+ 0.44	+ 0.09	59.26	12 27 50.84	+ 7 51.58	− 0.38
	32 Camelopard, U. C	W.	4	12 40 32.82	− 2.29	0.47	+ 9.45	+ 3.92	0.13	44.50	12 48 31.97	[47.47]	.....
	θ Virginis	E.	11	12 55 33.36	+ 0.49	+ 0.07	− 0.46	− 0.44	0.15	39.17	13 3 30.25	51.08	+ 0.12
	Polaris, L. C	E.	4	13 3 89.92	− 7.31	− 1.74	43.38	+18.71	0.17	56.37	1 11 47.41	[51.04]	.....
	Spica	E.	11	13 10 47.20	+ 0.47	+ 0.08	0.56	− 0.45	0.18	46.92	13 18 38.03	51.11	+ 0.09
	ζ Virginis	E.	11	13 20 29.93	+ 0.51	+ 0.10	− 0.37	− 0.44	+ 0.19	29.92	13 28 20.98	+ 7 51.06	+ 0.14

$a_1 = -0^s.163$ (circle E.); $a_2 = -0^s.476$ (circle W. to Regulus); $a_3 = -1^s.082$ (from β Corvi); $c = -0^s.423$ (circle E.).
Chronometer No. 1254 at $11^h\ 23^m$ *slow* $7^m\ 51^s.19 \pm 0^s.030$, *losing* $0^s.098$ per hour.

1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Mar. 20	δ Canis Majoris	E.	10	6 55 21.94	+ 0.42	− 0.14	+ 1.50	+ 1.64	− 0.62	24.74	7 3 19.13	+ 7 54.39	− 0.14
	δ Geminorum	E.	11	7 4 44.63	0.58	0.17	− 0.08	1.59	0.60	45.95	7 12 40.29	54.34	0.09
	α Geminorum	E.	6	7 18 42.92	0.62	0.09	− 0.47	1.74	0.56	44.16	7 26 38.43	54.27	− 0.02
	Procyon	E.	11	7 24 50.20	0.53	0.06	+ 0.47	1.48	0.54	52.08	7 32 46.30	54.22	+ 0.03
	β Geminorum	E.	9	7 29 45.43	+ 0.61	− 0.04	− 0.31	+ 1.67	0.53	46.83	7 37 41.02	54.19	+ 0.06
	λ Ursæ Minoris, L. C	E.	2	7 40 24.05	− 9.33	+ 0.35	+94.31	−78.51	0.49	30.38	19 48 24.60	[54.22]	.....
	3 Ursæ Majoris, U.C	E.	9	7 52 28.68	+ 0.98	− 0.05	− 3.90	+ 4.08	0.47	29.32	8 0 24.19	[54.87]	.....
	ε Hydræ	E.	11	8 32 14.23	+ 0.53	+ 0.13	+ 0.43	+ 1.48	− 0.36	16.44	8 40 10.56	+ 7 54.12	+ 0.13
	σ^2 Ursæ Majoris, U.C	W.	6	8 51 40.77	− 0.96	− 0.04	− 4.03	− 3.98	− 0.30	31.46	8 59 26.00	+ 7 [54.54]	.....
	κ Cancri	W.	7	8 53 7.73	0.54	0.02	+ 0.32	1.54	0.30	5.65	9 0 59.87	54.22	+ 0.03
	1 Draconis, U. C	W.	11	9 11 48.57	1.80	− 0.07	−12.96	10.70	0.25	22.79	9 19 16.84	[54.05]	.....
	ε Leonis	W.	11	9 30 55.18	0.59	+ 0.03	0.17	1.66	0.20	52.59	9 38 46.90	54.31	− 0.06
	μ Leonis	W.	10	9 37 49.41	0.60	+ 0.02	− 0.27	1.69	0.18	46.69	9 45 40.85	54.16	+ 0.09
	Regulus	W.	11	9 53 52.11	− 0.55	− 0.02	+ 0.27	− 1.55	− 0.13	50.13	10 1 44.40	+ 7 54.27	− 0.02
	τ Leonis	W.	11	11 13 39.25	− 0.52	+ 0.08	+ 0.50	− 1.52	+ 0.09	37.88	11 21 32.17	+ 7 54.29	− 0.04
	λ Draconis, U. C	W.	9	11 16 18.30	1.02	0.13	− 3.93	4.43	0.09	9.14	11 24 3.43	[54.29]	.....
	υ Leonis	W.	11	11 22 41.43	0.51	0.05	+ 0.60	1.51	0.11	40.17	11 30 34.52	54.35	− 0.10
	β Leonis	W.	11	11 34 50.36	0.56	0.04	+ 0.15	1.56	0.14	48.57	11 42 42.77	54.20	+ 0.05
	γ Ursæ Majoris	W.	9	11 39 28.86	0.76	0.03	− 1.70	2.59	0.16	24.00	11 47 18.27	54.27	− 0.02
	4 Draconis, U. C	W.	4	11 58 50.62	− 1.40	+ 0.08	− 7.36	− 7.46	+ 0.21	34.69	12 6 23.77	+ 7 [54.08]	.....

$a_1 = +1^s.872$ (circle E.); $a_2 = +2^s.076$ (circle W., to Regulus); $a_3 = +1^s.753$ (from τ Leonis); $c = +1^s.493$ (circle E.).
Chronometer No. 1254 at $10^h\ 43^m$ *slow* $7^m\ 54^s.25 \pm 0^s.014$, *losing* $0^s.165$ per hour.

Transits of stars observed at Havana, Cuba, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Mar. 24	λ Ursæ Minoris, S. P.	W.	5	8 9 36.81	+10.00	— 0.04	— 8.58	−15.90	— 0.03	21.66	19 48 29.10	[—20 52.56]	.....
	15 Argus	W.	9	8 23 6.04	— 0.37	0.05	0.14	+ 0.33	0.03	5.78	8 2 14.04	51.74	+ 0.01
	β Cancri	W.	11	8 30 37.16	0.49	0.03	0.04	0.30	0.03	36.87	8 9 45.16	51.71	— 0.02
	η Cancri	W.	11	8 46 22.00	0.54	— 0.02	0.01	0.32	0.02	21.73	8 25 29.97	51.76	+ 0.03
	ε Hydræ	W.	11	9 1 2.42	0.48	0.00	0.05	0.30	0.02	2.17	8 40 10.52	51.65	— 0.08
	κ Cancri	W.	11	9 21 51.82	0.50	+ 0.02	— 0.04	0.30	0.02	51.58	9 0 59.83	51.75	+ 0.02
	1 Draconis	W.	5	9 40 6.49	— 1.84	— 0.09	+ 1.05	+ 2.11	0.01	7.71	9 19 16.48	[51.23]	.....
	1 Draconis	E.	5	9 40 14.01	+ 1.84	+ 0.12	— 5.62	— 2.39	0.01	7.95	9 19 16.48	[51.47]	.....
	ε Leonis	E.	11	9 59 38.47	0.55	+ 0.05	0.02	0.37	0.01	38.67	9 38 46.87	51.80	+ 0.07
	μ Leonis	E.	11	10 6 32.51	0.56	— 0.05	— 0.06	0.38	0.01	32.57	9 45 40.82	51.75	+ 0.02
	α Leonis	E.	11	10 22 35.74	0.50	0.02	+ 0.18	0.34	— 0.01	36.05	10 1 44.38	51.67	— 0.06
	α Ursæ Majoris	E.	11	11 16 56.93	0.84	0.24	— 1.27	0.73	0.00	55.53	10 56 3.95	51.58	— 0.15
	δ Leonis	E.	11	11 28 21.12	0.54	0.15	+ 0.03	0.36	+ 0.01	21.19	11 7 29.42	51.77	+ 0.04
	δ Crateris	E.	4	11 33 58.44	0.41	0.12	+ 0.58	0.35	0.01	58.97	11 13 6.99	51.98	+ 0.25
	λ Draconis	E.	10	11 44 57.37	1.00	0.30	— 1.99	0.99	0.01	55.10	11 24 3.41	[51.69]	.....
	υ Leonis	E.	9	11 51 25.88	0.46	0.13	+ 0.36	0.34	0.01	26.24	11 30 34.53	51.71	— 0.02
	β Leonis	E.	11	12 3 34.38	0.51	0.14	0.13	0.35	0.01	34.54	11 42 42.79	51.75	+ 0.02
	o Virginis	E.	7	12 19 43.72	+ 0.49	— 0.16	+ 0.22	— 0.34	+ 0.02	43.95	11 58 52.23	—20 51.72	— 0.01

$a' = -0^s.174$ (circle W.); $a'' = +0^s.929$ (circle E.); $c = 0^s.318$ (+ with circle W.).
Chronometer No. 1295 at $10^h\ 52^m$ *fast* $20^m\ 51^s.73 \pm 0^s.010$, *losing* $0^s.011$ per hour.

1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Mar. 25	λ Ursæ Minoris, S. P.	E.	1	8 9 25.55	—10.00	+ 1.42	— 6.46	+14.18	- 0.22	24.47	19 48 31.26	[—20 53.21]	.....
	ε Hydræ	E.	11	9 1 2.34	+ 0.49	— 0.07	— 0.04	— 0.27	0.15	2.30	8 40 10.50	51.80	— 0.24
	ι Ursæ Majoris	E.	11	9 11 32.52	0.68	0.08	+ 0.09	0.40	0.13	32.68	8 50 40.54	52.14	+ 0.10
	κ Cancri	E.	11	9 21 51.77	0.50	0.08	— 0.03	0.27	0.11	51.78	9 0 59.82	51.96	— 0.08
	1 Draconis	E.	11	9 40 5.73	1.84	0.29	+ 0.79	1.89	0.08	6.10	9 19 16.38	[49.72]	.....
	ε Leonis	E.	11	9 59 38.84	0.55	0.07	0.00	0.29	0.06	38.97	9 38 46.85	52.12	+ 0.08
	μ Leonis	E.	11	10 6 32.79	0.56	0.03	+ 0.01	0.30	0.05	32.93	9 45 40.82	52.16	0.12
	α Leonis	E.	11	10 22 36.47	0.50	0.06	— 0.02	0.27	— 0.02	36.60	10 1 44.37	52.23	0.19
	l Leonis	E.	11	11 3 34.84	0.50	0.06	— 0.02	0.27	+ 0.04	35.03	10 42 42.81	52.22	+ 0.18
	Groombridge 1706	E.	3	11 10 53.70	+ 1.42	0.18	+ 0.54	— 1.33	0.06	54.21	10 50 2.66	[51.55]	.....
	Groombridge 1706	W.	4	11 10 49.99	— 1.42	0.18	+ 4.87	+ 1.13	0.06	54.45	10 50 2.06	[51.79]	.....
	δ Leonis	W.	11	11 28 21.76	0.54	0.06	— 0.04	0.24	0.08	21.44	11 7 29.42	52.02	— 0.02
	δ Crateris	W.	11	11 33 59.79	0.41	0.03	0.74	0.23	0.09	58.93	11 13 6.99	51.94	0.10
	τ Leonis	W.	11	11 42 24.69	0.47	— 0.01	0.40	0.23	0.10	24.14	11 21 32.18	51.96	0.08
	υ Leonis	W.	11	11 51 27.08	0.46	+ 0.04	0.47	0.23	0.12	26.54	11 30 34.53	52.01	— 0.03
	β Leonis	W.	11	12 3 35.13	0.51	0.04	— 0.17	0.24	0.14	34.87	11 42 42.79	52.08	+ 0.04
	γ Ursæ Majoris	W.	9	12 8 9.54	0.73	0.04	+ 1.06	0.39	0.14	10.44	11 47 18.28	52.16	+ 0.12
	o Virginis	W.	11	12 19 44.62	0.49	0.03	— 0.29	0.23	0.16	44.26	11 58 52.24	52.02	— 0.02
	4 Draconis	W.	11	12 27 16.29	1.41	0.09	+ 4.81	1.12	0.18	21.08	12 6 28.77	[52.31]	.....
	η Virginis	W.	11	12 34 24.81	0.46	+ 0.01	— 0.47	0.23	0.19	24.31	12 13 32.30	52.01	— 0.03
	β Corvi	W.	11	12 48 43.72	— 0.38	0.00	— 0.92	+ 0.25	+ 0.20	42.87	12 27 50.89	—20 51.98	— 0.06

$a' = -0^s.131$ (circle E.); $a'' = -1^s.187$ (circle W.); $= 0^s.247$ (+ with circle W.).
Chronometer No. 1295 at $10^h\ 39^m$ *fast* $20^m\ 52^s.04 \pm 0^s.018$, *losing* $0^s.093$ per hour.

Transits of stars observed at Santiago de Cuba, by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Mar. 24	ε Hydræ	W.	11	8 32 5.69	— 0.53	+ 0.12	— 0.09	— 0.24	— 0.36	4.59	8 40 10.51	+ 8 5.92	+ 0.02
	ι Ursæ Majoris	W.	11	8 42 35.52	— 0.72	+ 0.16	+ 0.27	— 0.36	0.33	34.54	8 50 40.57	6.03	— 0.11
	10-yr. Cat. '79, L. C.	W.	5	8 44 58.12	+ 3.13	— 0.11	— 2.17	+ 1.15	0.32	59.80	20 53 4.97	[4.47]	.....
	1 Draconis, U. C.	W.	11	9 [illegible] 11.87	— 1.80	+ 0.67	+ 2.37	— 1.69	0.26	11.16	9 19 16.48	[5.32]	.....
	ε Leonis	W.	11	9 30 41.73	0.59	0.22	0.03	0.26	0.20	40.93	9 38 46.87	5.94	0.00
	μ Leonis	W.	11	9 37 35.69	0.60	0.20	+ 0.05	0.27	0.19	34.88	9 45 40.82	5.94	0.00
	Regulus	W.	11	9 53 39.19	0.55	0.18	— 0.05	0.24	0.14	38.39	10 1 44.38	5.99	— 0.05
	γ^1 Leonis	W.	11	10 5 1.38	0.58	0.21	+ 0.00	0.25	0.11	0.65	10 13 6.46	5.81	+ 0.13
	9 Draconis, U. C.	W.	11	10 16 26.91	— 1.27	+ 0.47	+ 1.34	— 1.01	— 0.09	26.35	10 24 32.56	+ 8 [6.21]	.....
	τ Leonis	W.	9	11 13 27.21	— 0.52	— 0.06	— 0.15	— 0.24	+ 0.06	26.30	11 21 32.17	+ 8 5.87	+ 0.07
	λ Draconis, U. C.	W.	9	11 15 58.16	1.02	0.09	+ 1.22	0.70	0.07	57.64	11 24 3.41	[5.77]	0.00
	β Leonis	W.	11	11 34 37.68	0.56	0.03	— 0.05	0.25	0.12	36.91	11 42 42.79	5.88	+ 6.06
	γ Ursæ Majoris	W.	8	11 39 12.85	0.77	0.04	+ 0.52	0.41	0.13	12.28	11 47 18.27	5.99	— 0.05
	o Virginis	W.	11	11 50 47.21	0.54	0.06	— 0.10	0.24	0.16	46.43	11 58 52.23	5.80	+ 0.14
	4 Draconis, U. C.	W.	5	11 58 23.58	— 1.40	— 0.16	+ 2.28	— 1.18	+ 0.18	23.30	12 6 28.77	+ 8 [5.47]	.....
	4 Draconis, U. C.	E.	3	11 58 17.17	+ 1.40	— 0.08	+ 2.36	+ 0.98	+ 0.19	22.02	12 6 28.77	+ 8 [6.75]	.....
	η Virginis	E.	11	12 5 25.82	0.51	— 0.03	— 0.19	0.20	0.20	26.51	12 13 32.29	5.78	+ 0.16
	β Corvi	E.	11	12 19 44.38	0.43	0.00	0.41	0.22	0.24	44.86	12 27 50.89	6.03	— 0.09
	θ Virginis	E.	11	12 55 23.36	+ 0.49	+ 0.04	0.24	+ 0.20	0.33	24.18	13 3 30.31	6.13	— 0.19
	Polaris, L. C.	E.	5	13 3 82.76	— 7.31	— 1.08	—22.52	—10.11	+ 0.35	42.09	1 11 46.16	+ 8 [4.07]	.....

$a_1 = -0^s.379$ (circle W., 1st group to 9 Draconis.); $a_2 = -0^s.542$ (circle W., 2d group); $a_3 = -0^s.562$ (circle E.); $c = +0^s.219$ (circle E.).
Chronometer No. 1254 at 10^h 49m, *slow* 8m $5^s.94 \pm 0^s.019$, *losing* $0^s.157$ per hour.

1875.				*h. m. s.*	*s.*	*s.*	*s*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Mar. 25	α Geminorum	E.	11	7 18 28.93	+ 0.62	0.00	+ 0.18	+ 0.18	— 0.42	29.49	7 26 38.34	+ 8 8.85	— 0.03
	Procyon	E.	11	7 24 37.21	0.53	+ 0.01	— 0.18	0.16	0.41	37.32	7 32 46.22	8.90	— 0.08
	β Geminorum	E.	11	7 29 31.61	0.61	0.02	+ 0.12	0.18	0.40	32.14	7 37 40.94	8.80	+ 0.02
	φ Geminorum	E.	11	7 37 42.42	+ 0.60	+ 0.06	+ 0.12	+ 0.17	0.38	42.99	7 45 51.81	8.82	0.00
	λ Ursæ Minoris, L. C.	E.	3	7 40 76.07	— 9.33	— 1.21	—35.46	—10.44	0.36	19.27	19 48 30.21	[10.94]	.....
	3 Ursæ Majoris, U. C.	E.	7	7 52 12.67	+ 0.98	0.02	+ 1.47	+ 0.43	0.35	15.18	8 0 23.97	[8.79]	.....
	ι Ursæ Majoris	W.	11	8 42 32.36	— 0.72	— 0.01	+ 0.51	— 0.30	— 0.24	31.60	8 50 40.55	+ 8 8.95	— 0.13
	ε Leonis	W.	11	9 30 38.76	— 0.59	+ 0.10	+ 0.08	— 0.21	— 0.14	38.00	9 38 46.86	+ 8 8.86	— 0.04
	μ Leonis	W.	11	9 37 32.76	0.60	0.13	+ 0.12	0.22	0.12	32.07	9 45 40.81	8.74	+ 0.08
	Regulus	W.	11	9 53 36.36	0.55	0.11	— 0.13	0.20	0.09	35.50	10 1 44.37	8.87	— 0.05
	32 Ursæ Majoris, U. C.	W.	8	10 0 51.21	0.92	0.25	+ 1.66	0.47	0.08	51.65	10 9 0.32	[8.67]	.....
	γ^1 Leonis	W.	11	10 4 56.44	0.58	0.18	0.01	0.21	0.07	57.77	10 13 6.45	8.68	+ 0.14
	9 Draconis, U. C.	W.	11	10 16 22.06	— 1.27	+ 0.36	+ 3.36	— 0.83	— 0.04	24.00	10 24 32.51	+ 8 [8.51]	.....
	δ Leonis	W.	11	10 59 21.19	— 0.58	+ 0.04	+ 0.03	— 0.21	+ 0.05	20.52	11 7 29.41	+ 8 8.89	— 0.07
	τ Leonis	W.	11	11 13 24.37	0.52	0.02	— 0.32	0.20	0.08	23.43	11 21 32.18	8.75	+ 0.07
	λ Draconis, U. C.	W.	8	11 15 53.52	1.02	0.02	+ 2.52	0.57	0.08	54.55	11 24 3.38	[8.83]	.....
	β Leonis	W.	11	11 34 34.62	0.56	0.07	— 0.10	0.20	0.12	33.95	11 42 42.79	8.84	— 0.02
	o Virginis	W.	8	11 50 44.17	— 0.54	0.06	0.21	— 0.20	0.16	43.44	11 58 52.23	8.79	+ 0.03
	η Virginis	E.	10	12 5 22.91	+ 0.51	0.05	0.38	+ 0.16	0.19	23.44	12 13 32.30	8.86	— 0.04
	β Corvi	E.	11	12 19 41.97	+ 0.43	+ 0.04	— 0.83	+ 0.17	+ 0.22	42.00	12 27 50.89	+ 8 8.89	— 0.07

$a_1 = -0^s.704$ (circle E. and W. to ι Ursæ Majoris); $a_2 = -0^s.952$ (circle W. from ε Leonis); $a_3 = -1^s.128$ (circle W. and E. from δ Leonis); $c = +0^s.176$ (circle E.).
Chronometer No. 1254 at 10^h 37m *slow* 8m $8^s.89 \pm 0^s.012$, *losing* $0^s.127$ per hour.

Transits of stars observed at Havana, Cuba, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Nov. 26	Polaris	E.	9	1 35 2.06	+ 9.69	+ 0.88	−36.37	+10.76	− 0.03	46.99	1 13 32.28	[−21 14.71]	.....
	ϕ Persei	E.	9	1 57 8.29	0.76	0.07	0.67	0.40	− 0.02	8.83	1 35 54.25	14.58	− 0.18
	α Persei	E.	9	3 36 43.74	+ 0.76	0.18	− 0.64	+ 0.39	+ 0.02	44.45	3 15 29.56	14.89	+ 0.13
	f Tauri	W.	8	3 45 17.69	− 0.55	0.13	+ 0.34	− 0.30	0.02	17.33	3 24 2.50	14.83	0.07
	δ Persei	W.	9	3 55 23.84	0.74	0.15	− 1.08	0.43	0.03	21.77	3 34 6.95	14.82	0.06
	17 Tauri	W.	9	3 58 47.20	0.60	0.11	0.02	0.32	0.03	46.40	3 37 31.61	14.79	0.03
	ξ Persei	W.	9	4 12 12.32	0.66	0.10	0.46	0.36	0.04	10.98	3 50 56.14	14.84	+ 0.08
	Groombridge 750	W.	9	4 20 4.58	3.09	0.34	−18.73	3.52	0.04	39.62	3 58 24.96	[14.66]	.....
	γ Tauri	W.	9	4 34 0.32	0.56	0.06	+ 0.25	0.30	0.05	59.82	4 12 45.11	14.71	− 0.05
	δ Tauri	W.	9	4 37 3.23	− 0.57	+ 0.05	+ 0.19	− 0.31	+ 0.05	2.64	4 15 47.90	− 21 14.74	− 0.02

$a' = + 0^s.940$ (with circle E.); $a'' = + 1^s.767$ (with circle W.); $c = 0^s.273$ (+ with circle E.).
Chronometer No. 1295 at $2^h\ 51^m$ *fast* $21^m\ 14^s.76 \pm 0^s.014$, *losing* $0^s.027$ per hour.

1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Nov. 27	α Arietis	E.	9	2 21 25.27	+ 0.59	+ 0.10	0.00	+ 0.27	+ 0.06	26.29	2 0 11.64	− 21 14.65	− 0.10
	4 Ursæ Minoris, S. P.	E.	9	2 30 24.02	− 0.52	− 0.10	+11.19	− 1.20	0.04	33.43	14 9 18.97	[14.46]	.....
	ζ^2 Ceti	E.	9	2 42 47.85	+ 0.54	+ 0.19	0.61	+ 0.25	0.03	49.47	2 21 34.62	14.85	+ 0.10
	ν Arietis	E.	9	2 53 0.92	0.59	0.20	0.07	0.27	+ 0.03	2.08	2 31 47.27	14.81	+ 0.06
	η Tauri	E.	8	4 1 21.37	+ 0.60	0.17	0.02	+ 0.27	− 0.03	22.40	3 40 7.71	14.69	− 0.06
	γ Tauri	W.	9	4 34 0.27	− 0.56	0.13	0.36	− 0.30	0.05	59.85	4 12 45.12	14.73	0.02
	δ Tauri	W.	9	4 37 3.12	0.57	0.14	0.28	0.30	0.06	2.61	4 15 47.91	14.70	− 0.05
	ϵ Tauri	W.	9	4 42 38.82	0.58	0.14	0.21	0.30	0.06	38.23	4 21 23.46	14.77	+ 0.02
	α Tauri	W.	9	4 50 4.50	0.57	0.17	+ 0.31	0.30	0.07	4.04	4 28 49.24	14.80	+ 0.05
	9 Camelopardalis	W.	6	5 3 6.48	0.99	0.27	− 4.36	0.71	0.08	0.61	4 41 45.96	[14.65]	.....
	ϵ Aurigæ	W.	9	5 14 22.36	0.71	0.18	1.24	0.40	0.08	20.11	4 53 5.39	14.72	− 0.03
	η Aurigæ	W.	9	5 19 7.09	− 0.69	+ 0.18	− 1.06	− 0.39	− 0.08	5.05	4 57 50.30	− 21 14.75	0.00

$a' = + 2^s.345$ (with circle E.); $a'' = + 2^s.593$ (with circle W.); $c = 0^s.267$ (+ with circle E.).
Chronometer No. 1295 at $3^h\ 26^m$ *fast* $21^m\ 14^s.75 \pm 0^s.014$, *gaining* $0^s.047$ per hour.

Transits of stars observed at Key West, Fla., by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Nov. 26	α Cassiopeæ	W.	11	0 53 28.15	− 0.82	+ 0.08	+ 0.15	+ 0.12	+ 0.10	27.78	0 33 28.75	−19 59.03	− 0.03
	21 Cassiopeæ, U. C	W.	5	0 57 29.02	− 1.29	+ 0.12	+ 0.44	+ 0.26	0.10	28.65	0 37 29.51	[59.14]	.....
	32 Camelopard., L. C..	W.	11	1 8 10.19	+ 1.67	− 0.12	− 1.44	− 1.07	0.09	9.32	12 48 12.46	[56.86]	.....
	Polaris, U. C	W.	5	1 33 31.04	−10.03	+ 0.56	+ 6.09	+ 3.02	0.07	30.66	1 13 31.99	[58.67]	.....
	Piscium	W.	11	1 44 50.81	0.55	0.09	− 0.03	0.07	0.06	50.45	1 24 51.36	59.09	+ 0.03
	o Piscium	W.	11	1 58 50.77	0.52	0.07	0.04	0.07	0.04	50.39	1 38 51.34	59.05	− 0.01
	β Arietis	W.	11	2 7 47.45	0.57	0.08	− 0.01	0.07	0.04	47.06	1 47 47.99	59.07	+ 0.01
	50 Cassiopeæ, U. C....	W.	9	2 12 53.43	− 1.17	0.13	+ 0.37	+ 0.22	0.03	53.01	1 52 53.95	[59.06]	.....
	50 Cassiopeæ, U. C...	E.	6	2 12 51.68	+ 1.17	0.22	+ 0.37	− 0.35	0.03	53.12	1 52 53.95	[59.17]	.....
	α Arietis	E.	11	2 20 10.04	+ 0.58	+ 0.15	− 0.01	− 0.12	+ 0.03	10.67	2 0 11.64	−19 59.03	− 0.03
	α Persei	E.	11	3 35 27.77	+ 0.75	+ 0.18	+ 0.10	− 0.17	− 0.04	28.59	3 15 29.56	−19 59.03	− 0.03
	δ Persei	E.	11	3 54 5.38	0.73	0.19	+ 0.09	0.16	0.05	6.18	3 34 6.95	59.23	+ 0.17
	η Tauri	E.	11	4 0 6.15	+ 0.59	+ 0.17	0.00	− 0.12	0.06	6.73	3 40 7.70	59.03	− 0.03
	ξ Ursæ Minoris, L. C.	E.	11	4 8 27.26	− 0.58	− 0.20	− 0.76	+ 0.34	0.06	26.00	15 48 27.15	[58.85]	.....
	γ Tauri	E.	11	4 32 43.63	+ 0.55	+ 0.19	0.03	− 0.11	0.08	44.15	4 12 45.11	59.04	− 0.02
	ε Tauri	E.	11	4 41 21.92	0.57	0.20	0.02	0.12	0.09	22.46	4 21 23.45	59.01	0.05
	α Tauri.....	E.	11	4 48 47.74	0.56	0.20	− 0.02	0.11	0.10	48.27	4 28 49.23	59.04	− 0.02
	9 Camelop., U. C	E.	6	5 1 43.87	+ 1.00	+ 0.33	+ 0.26	− 0.27	− 0.11	45.08	4 41 46.08	−19 [59.00]	.....

$a_1 = -0^s.157$ (circle W. and E. to α Arietis); $a_2 = -0^s.159$ (circle E. from α Persei); $c = -0^s.091$ (circle E.).
Chronometer No. 1254 at $2^h\ 52^m$ *fast* $19^m\ 59^s.06 \pm 0^s.012$, *gaining* $0^s.049$ per hour.

1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Nov. 27	21 Cassiopeæ, U. C	W.	11	0 57 29.07	− 1.29	+ 0.22	+ 0.55	+ 0.40	+ 0.18	29.13	0 37 29.46	−19 [59.67]	.....
	32 Camelop., L. C.....	W.	11	1 8 13.23	+ 1.67	− 0.31	− 1.78	− 1.44	0.16	12.53	12 48 12.62	[59.91]	.....
	Polaris, U. C	W.	5	1 33 27.64	−10.03	+ 1.30	+ 7.42	+ 4.63	0.13	31.09	1 13 31.54	[59.55]	.....
	η Piscium	W.	3	1 44 51.24	0.55	0.08	− 0.03	0.11	0.12	50.97	1 24 51.36	59.61	− 0.05
	ν Piscium	W.	11	1 54 59.22	0.51	0.09	0.07	0.11	0.11	58.95	1 34 59.24	59.71	+ 0.05
	o Piscium	W.	11	1 58 51.20	0.52	0.09	0.05	0.11	0.10	50.93	1 38 51.33	59.60	− 0.06
	β Arietis	W.	11	2 7 47.84	0.57	0.10	− 0.02	0.12	0.09	47.56	1 47 47.98	59.58	− 0.08
	50 Cassiopeæ, U. C....	W.	9	2 12 53.96	− 1.17	+ 0.17	+ 0.46	+ 0.35	+ 0.09	53.86	1 52 53.93	−19 [59.93]	....
	50 Cassiopeæ, U. C....	E.	6	2 12 52.46	+ 1.17	+ 0.15	+ 0.10	− 0.48	+ 0.09	53.49	1 52 53.93	−19 [59.56]	.....
	α Arietis	E.	11	2 20 10.68	0.58	0.11	0.00	0.16	0.08	11.29	2 0 11.64	59.65	− 0.01
	ξ¹ Ceti	E.	11	2 26 25.56	0.52	0.10	− 0.01	0.15	0.07	26.09	2 6 26.31	59.78	+ 0.12
	ι Cassiopeæ, U. C....	E.	11	2 38 52.26	1.02	0.19	+ 0.07	0.38	+ 0.06	53.22	2 18 53.49	[59.73]	.....
	δ Persei	E.	11	3 54 5.95	0.73	0.13	+ 0.02	0.22	− 0.03	6.58	3 34 6.96	59.62	− 0.04
	η Tauri.....	E.	11	4 0 6.90	+ 0.59	+ 0.10	0.00	− 0.16	0.04	7.39	3 40 7.71	59.68	+ 0.02
	ξ Ursæ Minoris, L. C.	E.	11	4 8 26.98	− 0.58	− 0.14	− 0.20	+ 0.53	0.05	26.54	15 48 27.15	[59.39]	.....
	γ Tauri	E.	11	4 32 44.35	+ 0.55	+ 0.12	− 0.01	− 0.15	0.08	44.78	4 12 45.12	59.66	0.00
	ε Tauri.....	E.	11	4 41 22.72	0.57	0.13	0.00	0.16	0.09	23.17	4 21 23.46	59.71	+ 0.05
	α Tauri.....	E.	11	4 48 48.44	0.56	0.10	− 0.01	0.16	0.10	48.83	4 28 49.24	59.59	− 0.07
	9 Camelop., U. C	E.	6	5 1 44.86	+ 1.00	+ 0.22	+ 0.07	− 0.37	− 0.13	45.65	4 41 46.11	−19 [59.54]	.....

$a_1 = -0^s.144$ (circle W.); $a_2 = -0^s.042$ (circle E.); $c = -0^s.129$ (circle E).
Chronometer No. 1254 at $3^h\ 27^m$ *fast* $19^m\ 59^s.66 \pm 0^s.013$, *gaining* $0^s.071$ per hour.

Transits of stars observed at Havana, Cuba, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Nov. 28	Polaris	W.	6	1 35 1.03	— 9.69	— 1.94	+10.64	—13.69	— 0.09	46.26	1 13 31.35	[—21 14.91]	.....
	υ Persei	W.	9	1 51 40.00	0.75	0.23	0.17	0.48	0.07	38.59	1 30 23.57	—21 15.02	+ 0.08
	φ Persei	W.	9	1 57 10.64	0.76	0.27	0.20	0.50	0.06	9.25	1 35 54.26	14.99	+ 0.05
	α Trianguli	W.	6	2 7 17.48	0.63	0.23	+ 0.03	0.36	0.05	16.24	1 46 1.36	14.88	— 0.06
	α Arietis	W.	9	2 21 27.72	0.60	0.20	0.00	0.34	0.04	26.54	2 0 11.63	14.91	0.03
	ξ¹ Ceti	W.	9	2 27 42.30	0.51	0.17	— 0.07	0.33	0.04	41.15	2 6 26.31	14.84	0.10
	ξ² Ceti	W.	9	2 42 50.70	0.54	0.20	— 0.07	0.33	— 0.03	49.53	2 21 34.63	14.90	— 0.04
	ι Persei	W.	9	3 21 24.78	— 0.76	— 0.27	+ 0.18	— 0.49	0.00	23.44	3 0 8.36	15.08	+ 0.14
	δ Persei	E.	9	3 55 20.24	+ 0.74	+ 0.10	0.32	+ 0.42	+ 0.03	21.85	3 34 6.97	14.88	— 0.06
	η Tauri	E.	9	4 1 21.57	+ 0.60	+ 0.10	+ 0.01	+ 0.31	0.03	22.62	3 40 7.72	14.90	— 0.04
	ζ Ursæ Minoris, S. P.	E.	9	4 9 46.50	— 0.53	— 0.09	— 2.52	— 1.37	0.04	42.03	15 48 27.15	[14.88]	.....
	γ Tauri	E.	9	4 33 59.19	+ 0.56	+ 0.06	0.07	+ 0.29	0.06	0.09	4 12 45.16	14.93	— 0.01
	δ Tauri	E.	8	4 37 2.03	+ 0.57	+ 0.03	— 0.06	+ 0.30	+ 0.06	2.93	4 15 47.92	—21 15.01	+ 0.07

$a' = -0^s.275$ (with circle W.); $a'' = -0^s.527$ (with circle E); $c = 0^s.302$ (+ with circle E.).
Chronometer No. 1295 at $3^h\ 17^m$ *fast* $21^m\ 14^s.94 \pm 0^s.015$, *losing* $0^s.047$ per hour.

1875.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Nov. 29	ζ Andromedæ	E.	9	1 2 0.07	+ 0.60	+ 0.02	+ 0.01	+ 0.17	+ 0.11	0.98	0 40 46.19	—21 14.79	— 0.04
	μ Andromedæ	E.	9	1 11 6.22	0.67	— 0.02	+ 0.16	0.20	0.10	7.33	0 49 52.38	14.95	+ 0.12
	Piscium	E.	9	1 17 44.99	0.53	0.02	— 0.14	0.16	0.10	45.62	0 56 30.84	14.78	— 0.05
	β Andromedæ	E.	9	1 24 1.57	0.66	0.03	+ 0.13	0.19	0.09	2.61	1 2 47.78	14.83	0.00
	τ Piscium	E.	9	1 26 4.19	0.65	0.05	0.07	0.18	0.09	5.13	1 4 50.34	14.79	— 0.04
	Polaris	E.	5	1 34 9.89	9.68	0.70	+19.89	6.63	0.08	45.47	1 13 30.82	[14.65]	.....
	η Piscium	E.	9	1 46 5.54	0.56	0.05	— 0.08	0.16	0.08	6.21	1 24 51.35	14.86	+ 0.03
	υ Persei	E.	9	1 51 37.27	+ 0.75	0.08	+ 0.32	+ 0.23	0.07	38.56	1 30 23.56	15.00	+ 0.17
	φ Persei	W.	9	1 57 9.63	— 0.76	0.10	0.34	— 0.30	0.07	8.88	1 35 54.25	14.63	— 0.20
	ε Cassiopeæ	W.	9	2 6 46.02	0.93	0.14	0.67	0.43	0.06	45.25	1 45 30.16	15.09	+ 0.26
	50 Cassiopeæ	W.	9	2 14 9.62	— 1.16	— 0.19	+ 1.14	— 0.62	0.06	8.85	1 52 53.90	[14.95]	.....
	4 Ursæ Minoris, S. P.	W.	9	2 30 35.16	+ 0.52	+ 0.06	— 2.25	+ 0.96	+ 0.05	34.50	14 9 19.09	[15.41]	.....
	ξ Persei	W.	9	4 12 12.09	— 0.66	— 0.17	+ 0.12	— 0.24	— 0.02	11.12	3 50 56.19	14.93	+ 0.10
	λ Tauri	W.	2	4 15 5.13	— 0.55	— 0.14	— 0.09	— 0.20	— 0.02	4.13	3 53 49.55	—21 14.58	— 0.25

$a' = -0^s.514$ (with circle E.); $a'' = -0^s.472$ (with circle W.); $c = 0^s.176$ (+ with circle E.).
Chronometer No. 1295 at $3^h\ 40^m$ *fast* $21^m\ 14^s.83 \pm 0^s.014$, *gaining* $0^s.040$ per hour.

Transits of stars observed at Key West, Fla., by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Nov. 28	α Cassiopeæ	W.	11	0 53 29.20	— 0.82	+ 0.03	— 0.06	+ 0.19	+ 0.08	28.62	0 33 28.71	— 19 59.91	— 0.24
	21 Cassiopeæ, U. C	W.	11	0 57 30.97	— 1.29	+ 0.09	— 0.18	+ 0.39	0.08	30.06	0 37 29.41	— 20 [0.65]	.....
	32 Camelopard., L. C.	W.	11	1 8 12.06	+ 1.67	— 0.12	+ 0.59	— 1.39	0.07	12.88	12 48 12.80	[0.08]	.....
	Polaris, U. C	W.	7	1 33 38.39	—10.03	+ 0.94	— 2.45	+ 4.46	0.06	31.37	1 13 31.06	[0.31]	.....
	η Piscium	W.	11	1 44 51.96	0.55	0.04	+ 0.01	0.11	0.05	51.62	1 24 51.35	0.27	+ 0.12
	ν Piscium	W.	11	1 54 59.83	0.51	0.03	0.02	0.11	0.05	59.53	1 34 59.23	0.30	0.15
	ο Piscium	W.	11	1 58 51.87	0.52	0.03	0.02	0.11	0.04	51.55	1 38 51.33	0.22	0.07
	β Arietis	W.	11	2 7 48.56	0.57	0.03	+ 0.01	0.11	0.04	48.18	1 47 47.98	— 20 0.20	+ 0.05
	50 Cassiopeæ, U. C	W.	9	2 12 54.73	— 1.17	+ 0.04	— 0.15	+ 0.34	+ 0.04	53.83	1 52 53.90	— 19[59.93]	.....
	50 Cassiopeæ, U. C	E.	6	2 12 52.69	+ 1.17	+ 0.22	+ 0.49	— 0.32	+ 0.04	54.29	1 52 53.90	— 20 [0.39]	.....
	α Arietis	E.	11	2 20 11.13	0.58	0.17	— 0.01	0.15	0.03	11.75	2 0 11.63	0.12	— 0.03
	ξ' Ceti	E.	11	2 26 25.94	0.52	0.17	— 0.06	0.14	0.03	26.46	2 6 26.31	0.15	0.00
	ι Cassiopeæ, U. C	E.	11	2 38 52.34	+ 1.02	+ 0.26	+ 0.35	— 0.36	+ 0.02	53.63	2 18 53.47	— 20 [0.16]	.....
	η Tauri	E.	11	4 0 7.35	+ 0.59	+ 0.17	0.00	— 0.16	— 0.02	7.93	3 40 7.72	— 20 0.21	+ 0.06
	ξ Ursæ Minoris, L. C.	E.	11	4 8 28.54	— 0.58	— 0.17	— 1.05	+ 0.51	0.03	27.22	15 48 27.16	[0.06]	.....
	γ Tauri	E.	11	4 32 44.76	+ 0.55	+ 0.17	0.04	— 0.15	0.04	45.25	4 12 45.13	0.12	— 0.03
	ε Tauri	E.	11	4 41 23.04	0.57	0.18	0.02	0.15	0.05	23.57	4 21 23.47	0.10	0.05
	α Tauri	E.	11	4 48 48.85	0.56	0.19	— 0.03	0.15	0.05	49.37	4 28 49.26	0.11	— 0.04
	9 Camelopard., U. C	E.	6	5 1 45.24	+ 1.00	+ 0.33	+ 0.36	— 0.35	— 0.06	46.52	4 41 41.13	— 20 [0.39]	.....

$a_1 = +0^s.064$ (circle W.); $a_2 = -0^s.207$ (circle E., 1st group to ι Cassiopeæ); $a_2 = -0^s.221$ (circle E., 2d group); $c = -0^s.124$ (circle E.).
Chronometer No. 1254 at $3^h\ 18^m$ *fast* $20^m\ 0^s.15 \pm 0^s.021$, *gaining* $0^s.032$ per hour.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1875.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Nov. 29	η Piscium	W.	11	1 44 52.32	— 0.55	+ 0.16	— 0.04	+ 0.11	+ 0.05	52.05	1 24 51.35	— 20 0.70	— 0.05
	ν Piscium	W.	11	1 55 0.34	0.51	0.12	0.07	0.11	0.05	0.04	1 34 59.23	0.81	+ 0.06
	ο Piscium	W.	11	1 58 52.30	0.52	0.13	0.06	0.11	0.05	52.01	1 38 51.33	0.68	— 0.07
	β Arietis	W.	11	2 7 48.91	0.57	0.13	— 0.02	0.12	0.05	48.62	1 47 47.98	0.64	— 0.11
	50 Cassiopeæ, U. C	W.	9	2 12 54.71	— 1.17	+ 0.28	+ 0.47	+ 0.35	+ 0.04	54.68	1 52 53.92	— 20 [0.76]	.....
	50 Cassiopeæ, U. C	E.	5	2 12 53.24	+ 1.17	+ 0.31	+ 0.21	— 0.47	+ 0.04	54.50	1 52 53.92	— 20 [0.58]	.....
	α Arietis	E.	11	2 20 11.74	0.58	0.20	0.00	0.16	0.04	12.40	2 0 11.63	0.77	+ 0.02
	ξ' Ceti	E.	11	2 26 26.56	0.52	0.24	— 0.02	0.15	0.04	27.19	2 6 26.31	0.88	+ 0.13
	ι Cassiopeæ, U. C	E.	11	2 38 52.65	+ 1.02	+ 0.47	+ 0.15	— 0.38	0.03	53.94	2 18 53.47	[0.47]	.....
	5 Ursæ Minoris, L. C.	E.	11	2 47 46.79	— 0.43	— 0.24	— 0.37	+ 0.46	+ 0.03	46.24	14 27 45.85	— 20 [0.39]	.....
	ξ Ursæ Minoris, L. C.	E.	10	4 8 29.40	— 0.58	— 0.06	— 1.49	+ 0.54	— 0.01	27.80	15 48 27.18	— 20 [0.62]	.....
	γ Tauri	E.	11	4 32 45.56	+ 0.55	+ 0.05	0.05	— 0.15	0.03	45.93	4 12 45.14	0.79	+ 0.04
	ε Tauri	E.	11	4 41 23.80	0.57	0.06	0.03	0.16	0.03	24.21	4 21 23.49	0.72	— 0.03
	α Tauri	E.	11	4 48 49.65	0.56	0.06	— 0.05	0.15	0.03	50.04	4 28 49.27	0.77	+ 0.02
	9 Camelopard., U. C	E.	6	5 1 45.82	+ 1.00	+ 0.11	+ 0.51	— 0.36	— 0.04	47.04	4 41 46.15	— 20 [0.89]	.....

$a_1 = -0^s.199$ (circle W.); $a_2 = -0^s.089$ (circle E., 1st group to 5 Ursæ Minoris); $a_2 = -0^s.314$ (circle E., 2d group); $c = -0^s.129$ (circle E.).
Chronometer No. 1251 at $3^h\ 40^m$ *fast* $20^m\ 0^s.75 \pm 0^s.016$, *gaining* $0^s.029$ per hour.

Transits of stars observed at St. Thomas, West Indies, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Jan. 10	ν Tauri	W.	9	3 8 11.42	− 0.54	+ 0.06	+ 0.04	+ 0.01	− 0.03	10.96	3 56 34.58	+ 48 23.02	− 0.04
	o^1 Eridani	W.	9	3 17 26.68	0.50	0.12	0.08	0.01	0.03	26.36	4 5 49.87	23.51	+ 0.07
	γ Tauri	W.	9	3 24 22.10	0.57	0.28	+ 0.01	0.01	0.02	21.81	4 12 45.29	23.48	+ 0.10
	9 Camelopardalis	W.	6	3 53 23.44	− 0.91	0.45	− 0.34	+ 0.01	0.01	22.64	4 41 46.27	[23.63]	.....
	9 Camelopardalis	E.	6	3 53 21.63	+ 0.91	0.22	− 0.18	− 0.11	− 0.01	22.46	4 41 46.27	[23.81]	.....
	ε Orionis	E.	9	4 41 32.17	0.52	0.19	+ 0.03	0.05	+ 0.02	32.88	5 29 56.61	23.73	− 0.15
	ν Orionis	E.	9	5 12 6.46	0.57	0.16	+ 0.01	0.05	0.04	7.19	6 0 30.95	23.76	− 0.18
	22 Camelopardalis	E.	9	5 16 49.78	0.98	0.26	− 0.20	0.14	0.05	50.73	6 5 14.42	[23.69]	.....
	γ Geminorum	E.	9	5 42 10.29	0.57	0.04	0.00	0.05	0.06	10.91	6 30 34.41	23.50	+ 0.09
	15 Monocerotis	E.	9	5 45 46.20	0.55	0.02	+ 0.01	0.05	0.06	46.79	6 34 10.41	23.62	− 0.04
	ϵ Geminorum	E.	9	5 47 55.66	0.60	+ 0.02	− 0.01	0.05	0.06	56.28	6 36 19.75	23.47	+ 0.11
	ϵ Canis Majoris	E.	9	6 5 22.76	0.37	− 0.05	+ 0.08	0.05	0.08	23.19	6 53 46.72	23.53	0.05
	ξ Geminorum	E.	9	6 8 22.75	0.59	0.10	0.00	0.05	0.08	23.27	6 56 46.81	23.54	0.04
	δ Canis Majoris	E.	8	6 14 58.51	0.44	0.13	+ 0.08	0.05	0.08	58.93	7 3 22.49	23.56	0.02
	Piazzi VII, 67	E.	6	6 29 37.98	+ 0.96	0.23	− 0.20	− 0.14	0.09	38.46	7 18 2.13	[23.67]	.....
	Piazzi VII, 67	W.	6	6 29 38.28	− 0.96	0.05	+ 1.12	+ 0.02	0.09	38.50	7 18 2.13	[23.63]	.....
	α Geminorum	W.	9	6 38 19.79	0.63	− 0.01	+ 0.15	0.01	0.10	19.41	7 26 42.97	23.56	+ 0.02
	α Canis Minoris	W.	9	6 44 26.87	0.54	+ 0.02	− 0.12	0.01	0.10	26.34	7 32 50.04	23.70	− 0.12
	β Geminorum	W.	9	6 49 22.20	− 0.62	+ 0.03	+ 0.11	+ 0.01	+ 0.10	21.83	7 37 45.32	+ 48 23.49	+ 0.09

$a' = +0^s.186$ (circle W. before reversal); $a'' = +0^s.097$ (circle E.); $a''' = -0^s.525$ (circle W. after reversal); $c = 0^s.027$ (+ with circle W.).
Chronometer No. 1295 at $4^h\ 4^m$ *slow* $48^m\ 23^s.58 \pm 0^s.017$, *losing* $0^s.037$ per hour.

1876.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Jan. 12	ι Cassiopeæ	W.	9	1 30 28.82	− 0.93	− 0.15	+ 1.84	− 0.07	− 0.08	29.43	2 18 52.33	[+48 22.90]	.....
	η Eridani	W.	9	2 2 0.91	0.49	0.14	− 0.45	0.03	0.06	59.74	2 50 22.88	23.14	− 0.07
	α Ceti	W.	9	2 7 26.42	0.53	0.09	− 0.25	0.03	0.06	25.46	2 55 48.56	23.10	− 0.03
	48 Cephei	W.	11	2 16 15.25	1.29	0.21	+ 3.74	0.12	0.05	17.32	3 4 40.54	[23.22]	.....
	α Persei	W.	9	2 27 6.39	0.73	0.13	+ 0.76	0.04	0.05	6.20	3 15 29.35	23.15	− 0.08
	o Tauri	W.	9	2 29 46.97	0.55	0.09	− 0.16	0.03	0.05	46.09	3 18 9.21	23.12	− 0.05
	ξ Tauri	W.	9	2 32 5.48	0.55	0.08	− 0.15	0.03	0.05	4.62	3 20 27.56	22.94	+ 0.13
	η Tauri	W.	9	2 51 45.36	− 0.59	0.08	+ 0.10	0.03	0.04	44.72	3 40 7.75	23.03	0.04
	ξ Persei	E.	9	2 57 57.72	+ 0.63	0.15	+ 0.18	0.01	0.03	58.34	3 46 21.27	22.93	+ 0.14
	γ^1 Eridani	E.	9	3 3 52.74	0.48	0.17	− 0.36	0.01	0.03	52.65	3 52 15.72	23.07	0.00
	γ Tauri	E.	9	3 24 21.75	0.57	0.03	0.03	− 0.01	0.02	22.23	4 12 45.28	23.05	+ 0.02
	δ Tauri	E.	9	3 27 24.56	0.57	0.05	− 0.01	0.00	0.02	25.05	4 15 48.09	23.04	+ 0.03
	ϵ Tauri	E.	9	3 33 0.11	0.58	− 0.10	+ 0.01	− 0.01	− 0.02	0.56	4 21 23.67	23.11	− 0.04
	Groombridge, 966	E.	6	4 34 47.53	+ 1.17	+ 0.13	2.11	0.05	+ 0.01	50.90	5 23 14.06	[23.16]	.....
	Groombridge, 966	W.	4	4 34 48.77	− 1.17	0.19	+ 3.22	0.11	0.02	50.92	5 23 14.06	[23.14]	.....
	ϵ Orionis	W.	9	4 41 34.33	0.52	0.09	− 0.34	0.03	0.02	33.55	5 29 56.61	23.06	+ 0.01
	κ Orionis	W.	9	4 53 31.71	− 0.49	0.02	− 0.48	− 0.03	+ 0.02	30.75	5 41 53.88	+ 48 23.13	− 0.06

$a' = -0^s.962$ (circle W. before reversal); $a'' = -0^s.655$ (circle E.); $a''' = -1^s.001$ (circle W. after reversal); $c = 0^s.007$ (+ with circle E.).
Chronometer No. 1295 at $4^h\ 4^m$ *slow* $48^m\ 23^s.07 \pm 0^s.014$, *losing* $0^s.030$ per hour.

Transits of stars observed at Kingston, Jamaica, by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Jan. 10	48 Cephei, U. C.....	E.	6	3 5 7.98	+ 1.25	− 1.25	+ 0.56	− 0.92	+ 0.02	8.64	3 4 40.68	− 0 [27.96]	.....
	α Persei.....	E.	10	3 15 57.04	0.71	0.14	+ 0.11	0.31	0.02	57.43	3 15 29.38	28.05	0.00
	ξ Tauri	E.	11	3 20 55.47	0.54	0.11	− 0.02	0.21	0.02	55.69	3 20 27.57	28.12	+ 0.07
	ƒ Tauri	E.	11	3 24 30.22	0.55	0.11	− 0.01	0.21	0.02	30.46	3 24 2.48	27.98	− 0.07
	δ Persei.....	E.	11	3 34 34.73	0.70	0.14	+ 0.10	0.30	0.01	35.10	3 34 6.90	28.20	+ 0.15
	17 Tauri	E.	11	3 37 59.32	0.59	0.12	0.02	0.22	0.01	59.60	3 37 31.63	27.97	− 0.08
	η Tauri	E.	11	3 40 35.51	0.59	0.12	+ 0.02	0.22	+ 0.01	35.79	3 40 7.76	28.03	0.02
	Aldebaran	E.	11	4 29 17.05	0.56	0.05	0.00	0.21	− 0.01	17.34	4 28 49.48	27.86	− 0.19
	τ Tauri	E.	11	4 35 17.10	0.58	0.06	+ 0.01	0.22	0.01	17.40	4 34 49.32	28.08	+ 0.03
	9 Camelopard. U. C...	E.	6	4 42 14.01	+ 0.89	− 0.12	+ 0.26	− 0.50	− 0.02	14.52	4 41 46.42	− 0 [28.10]	.....
	9 Camelopard. U. C ..	W.	7	4 42 15.36	− 0.89	− 0.05	− 0.61	+ 0.41	− 0.02	14.19	4 41 46.42	− 0 [27.77]	.....
	ι Aurigæ	W.	11	4 49 25.06	− 0.62	− 0.03	− 0.10	+ 0.20	0.02	24.49	4 48 56.45	28.04	− 0.01
	ε Ursæ Minoris, L. C .	W.	11	4 59 3.13	+ 0.71	+ 0.05	+ 2.43	− 1.23	0.02	5.07	16 58 37.06	[28.01]	.....
	β Orionis	W.	11	5 9 4.38	− 0.49	− 0.04	0.15	+ 0.17	0.03	4.14	5 8 36.00	28.14	+ 0.09
	τ Orionis.....	W.	11	5 12 4.71	0.49	0.04	+ 0.14	0.17	0.03	4.46	5 11 36.45	28.01	− 0.04
	β Tauri	W.	11	5 18 57.29	0.60	0.04	− 0.07	0.19	0.03	56.74	5 18 28.62	28.12	+ 0.07
	Groom., 966, U. C ...	W.	11	5 23 43.94	− 1.13	− 0.13	− 1.08	+ 0.64	− 0.03	42.21	5 23 14.09	− 0 [28.12]	.....

$a_1 = -0^s.143$ (circle E.); $a_2 = +0^s.331$ (circle W.); $c = -0^s.183$ (circle E.).
Chronometer No. 1254 at $4^h\ 5^m$ *fast* $0^m\ 28^s.05 \pm 0^s.017$, *gaining* $0^s.026$ per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Jan. 12	48 Cephei, U. C.....	E.	6	3 5 8.69	+ 1.25	− 0.58	− 0.28	+ 1.31	+ 0.06	10.45	3 4 40.54	− 0 [29.91]	.....
	α Persei	E.	11	3 15 58.44	0.71	0.28	− 0.06	0.44	0.05	59.30	3 15 29.35	29.95	− 0.09
	ξ Tauri	E.	11	3 20 57.04	0.54	0.19	+ 0.11	0.29	0.04	57.83	3 20 27.55	30.28	+ 0.24
	ƒ Tauri	E.	11	3 24 31.71	0.55	0.19	+ 0.01	0.30	0.04	32.42	3 24 2.46	29.96	− 0.08
	δ Persei	E.	11	3 34 36.24	0.70	0.24	− 0.05	0.43	0.03	37.11	3 34 6.87	30.24	+ 0.20
	17 Tauri	E.	11	3 38 0.73	0.59	0.15	0.01	0.32	0.03	1.51	3 37 31.62	29.89	− 0.15
	η Tauri	E.	11	3 40 36.97	0.59	0.15	− 0.01	0.32	+ 0.02	37.74	3 40 7.75	29.99	0.05
	Aldebaran	E.	11	4 29 18.58	0.56	0.02	0.00	0.30	− 0.02	19.40	4 28 49.47	29.93	− 0.11
	τ Tauri	E.	11	4 35 18.54	0.58	0.04	− 0.01	0.32	0.03	19.36	4 34 49.31	30.05	+ 0.01
	9 Camelopard., U. C ..	E.	6	4 42 15.17	+ 0.89	− 0.08	− 0.13	+ 0.72	− 0.03	16.54	4 41 46.39	− 0 [30.15]	.....
	9 Camelopard., U. C ..	W.	10	4 42 19.11	− 0.89	− 0.48	− 0.63	− 0.81	− 0.04	16.26	4 41 46.39	− 0 [29.87]	.....
	ι Aurigæ	W.	10	4 49 27.99	− 0.62	− 0.38	− 0.11	− 0.39	0.04	26.45	4 48 56.44	30.01	− 0.03
	ε Ursæ Minoris, L. C .	W.	11	4 59 0.97	+ 0.71	+ 0.48	+ 2.48	+ 2.44	0.05	7.03	16 58 37.23	[29.80]	.....
	β Orionis	W.	11	5 9 7.12	− 0.49	− 0.28	0.18	− 0.33	0.06	6.14	5 8 35.99	30.15	+ 0.11
	τ Orionis.....	W.	11	5 12 7.56	0.49	0.29	+ 0.17	0.33	0.07	6.55	5 11 36.44	30.11	+ 0.07
	β Tauri	W.	11	5 18 60.05	0.60	0.35	− 0.08	0.38	0.07	58.57	5 18 28.62	29.95	− 0.09
	Groom., 966, U. C ...	W.	10	5 23 47.88	− 1.13	− 0.65	− 1.10	− 1.27	− 0.08	43.65	5 23 14.05	− 0 [29.60]	.....

$a_1 = +0^s.072$ (circle E.); $a_2 = +0^s.340$ (circle W.); $c = +0^s.309$ (circle E.).
Chronometer No. 1254 at $4^h\ 6^m$ *fast* $0^m\ 30^s.04 \pm 0^s.024$, *gaining* $0^s.058$ per hour.

Transits of stars observed at St. Thomas, West Indies, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Jan. 13	o Tauri	E.	9	2 29 46.13	+ 0.55	− 0.13	− 0.10	− 0.04	− 0.02	46.39	3 18 9.21	+ 48 22.82	+ 0.01
	ξ Tauri	E.	9	2 32 4.56	0.55	0.13	- 0.10	0.04	0.02	4.82	3 20 27.56	22.74	+ 0.09
	5 Camelopardalis	E.	7	2 48 54.27	1.02	0.20	+ 1.48	0.12	0.02	56.43	3 27 19.26	[22.83]	.....
	o^1 Eridani	E.	9	3 17 26.83	0.50	0.05	— 0.26	0.04	0.01	26.97	4 5 49.85	22.88	− 0.05
	γ Tauri	E.	9	3 24 22.01	0.57	0.13	0.03	0.04	0.01	22.37	4 12 45.27	22.90	0.07
	δ Tauri	E.	9	3 27 24.77	0.57	0.09	− 0.01	0.04	0.01	25.19	4 15 48.09	22.90	0.07
	ε Tauri	E.	9	3 33 0.29	0.58	0.01	+ 0.01	0.04	− 0.01	0.82	4 21 23.67	22.85	− 0.02
	9 Camelopardalis	E.	6	3 53 21.48	+ 0.91	0.02	1.11	− 0.10	0.00	23.38	4 41 46.22	[22.84]	.....
	9 Camelopardalis	W.	6	3 53 22.58	− 0.91	0.17	+ 1.66	0.00	0.00	23.16	4 41 46.22	[23.06]	.....
	ε Orionis	W.	9	4 41 34.74	0.52	0.11	— 0.31	0.00	0.00	33.80	5 29 56.61	22.81	+ 0.02
	α Columbæ	W.	9	4 46 49.73	0.41	0.10	0.87	0.00	+ 0.01	48.36	5 35 11.15	22.79	+ 0.04
	κ Orionis	W.	9	4 53 32.04	0.49	0.13	0.43	0.00	0.01	31.00	5 41 53.88	22.88	− 0.05
	α Orionis	W.	9	5 0 6.89	0.55	0.15	0.17	0.00	0.01	6.03	5 48 28.89	22.86	− 0.03
	ν Orionis	W.	9	5 12 8.94	0.57	0.14	− 0.05	0.00	0.01	8.19	6 0 30.98	22.79	+ 0.04
	22 Camelopardalis	W.	5	5 16 51.04	0.98	0.25	+ 1.99	− 0.01	0.01	51.80	6 5 14.42	[22.62]	.....
	μ Geminorum	W.	9	5 27 6.92	− 0.59	− 0.14	+ 0.07	0.00	+ 0.01	6.27	6 15 29.08	+ 48 22.81	+ 0.02

$a' = -0^s.607$ (circle E.); $a'' = -0^s.905$ (circle W.); $c = 0^s.019$ (+ with circle W.).
Chronometer No. 1295 at $4^h\ 16^m$ *slow* $48^m\ 22^s.83 \pm 0^s.009$, *losing* $0^s.011$ per hour.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Jan. 14	δ Ceti	E.	9	1 44 46.98	− 0.52	− 0.02	− 0.66	− 0.20	− 0.05	45.53	2 33 8.19	+ 48 22.66	− 0.07
	γ Ceti	E.	9	1 48 31.89	0.53	0.02	− 0.56	0.20	0.05	30.53	2 36 53.11	22.58	+ 0.01
	41 Arietis	E.	9	1 54 19.62	0.60	0.03	+ 0.33	0.23	0.05	19.04	2 42 41.64	22.60	− 0.01
	τ Persei	E.	9	1 57 5.55	0.75	− 0.04	+ 1.88	0.33	0.05	6.26	2 45 28.78	22.52	+ 0.07
	ε Ceti	E.	9	2 7 27.29	0.53	0.00	− 0.54	0.20	0.04	25.98	2 55 48.54	22.56	+ 0.03
	48 Cephei	E.	9	2 16 11.88	1.29	− 0.05	+ 8.05	0.93	0.04	17.62	3 4 40.40	[22.78]	.....
	o Tauri	E.	9	2 29 47.79	0.55	0.09	− 0.35	0.21	0.03	46.56	3 18 9.20	22.64	− 0.05
	5 Camelopardalis	E.	2	2 48 53.45	− 1.02	0.17	+ 5.05	− 0.62	0.03	56.66	3 37 19.23	[22.57]	.....
	5 Camelopardalis	W.	6	2 48 50.84	+ 1.02	0.11	4.27	+ 0.50	0.02	56.50	3 37 19.23	22.73	.....
	ζ Persei	W.	9	2 57 57.47	0.63	− 0.02	+ 0.47	0.20	0.02	58.73	3 46 21.26	22.53	+ 0.06
	ν Tauri	W.	9	3 8 11.74	0.54	+ 0.02	− 0.38	0.16	− 0.02	12.06	3 56 34.56	22.50	0.09
	κ Orionis	W.	9	4 53 31.48	0.49	+ 0.02	0.84	0.17	+ 0.02	31.34	5 41 53.88	22.54	0.05
	α Orionis	W.	9	5 0 5.92	0.55	0.00	− 0.33	0.17	0.02	6.33	5 48 28.89	22.56	+ 0.03
	θ Aurigæ	W.	9	5 2 53.38	0.65	− 0.01	+ 0.72	0.21	0.02	54.97	5 51 17.65	22.68	− 0.09
	ν Orionis	W.	9	5 12 7.75	0.57	0.04	− 0.10	0.17	0.03	8.38	6 0 30.99	22.61	− 0.02
	22 Camelopardalis	W.	7	5 16 46.78	+ 0.98	− 0.02	+ 3.85	+ 0.46	+ 0.03	52.08	6 5 14.42	[+ 48 22.34]	.....

$a' = -2^s.071$ (circle E.); $a'' = -1^s.752$ (circle W.); $c = 0^s.184$ (+ with circle W.).
Chronometer No. 1295 at $4^h\ 1^m$ *slow* $48^m\ 22^s.59 + 0^s.011$, *losing* $0^s.022$ per hour.

Transits of stars observed at Kingston, Jamaica, by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Jan. 13	ι Cassiopeæ, U. C....	W.	8	2 19 22.62	− 0.90	+ 0.03	+ 0.60	+ 0.46	+ 0.07	22.80	2 18 52.29	− 0 [30.51]	.....
	ζ^2 Ceti	W.	5	2 22 5.74	0.54	0.02	− 0.06	0.18	0.07	5.41	2 21 34.38	31.03	+ 0.01
	δ Ceti	W.	11	2 33 39.52	0.51	0.02	0.10	0.18	0.06	39.17	2 33 8.19	30.98	− 0.04
	γ^2 Ceti	W.	10	2 37 24.47	0.52	0.03	− 0.08	0.18	0.06	24.14	2 36 53.12	31.02	0.00
	41 Arietis	W.	11	2 43 12.85	0.60	0.03	+ 0.05	0.20	0.06	12.59	2 42 41.64	30.95	− 0.07
	47 Cephei, U. C	W.	11	2 50 11.18	1.37	0.10	+ 1.43	0.95	0.05	12.34	2 49 41.75	[30.59]	.....
	α Ceti	W.	11	2 56 19.94	0.52	0.04	− 0.08	0.18	0.05	19.61	2 55 48.55	31.06	+ 0.04
	48 Cephei, U. C	W.	6	3 5 11.21	− 1.25	+ 0.12	+ 1.23	+ 0.83	+ 0.05	12.29	3 4 40.47	− 0 [31.89]	.....
	48 Cephei, U. C	E.	8	3 5 9.14	+ 1.25	+ 0.09	+ 2.16	− 1.01	+ 0.04	11.67	3 4 40.47	− 0 [31.20]	.....
	ξ Arietis	E.	3	3 8 17.63	0.58	0.04	0.03	0.24	0.04	18.08	3 7 47.15	30.93	− 0.09
	α Persei.....	E.	11	3 15 59.47	0.71	0.05	+ 0.44	0.34	0.04	60.37	3 15 29.33	31.04	+ 0.02
	ξ Tauri.....	E.	11	3 20 58.37	0.54	0.04	− 0.08	0.23	0.04	58.68	3 20 27.55	31.13	0.11
	ζ Tauri.....	E.	11	3 24 33.15	0.55	0.04	− 0.05	0.23	+ 0.03	33.49	3 24 2.45	31.04	0.02
	τ Tauri.....	E.	11	4 35 19.82	0.58	0.16	+ 0.05	0.24	− 0.01	20.36	4 34 49.31	31.05	+ 0.03
	9 Camelopard., U. C..	E.	11	4 42 15.91	0.89	0.23	1.02	0.55	0.02	17.48	4 41 46.37	[31.11]	.....
	ι Aurigæ.....	E.	11	4 49 26.82	+ 0.62	+ 0.16	+ 0.17	− 0.27	0.02	27.48	4 48 56.44	31.04	+ 0.02
	ε Ursæ Minoris, L. C.	E.	11	4 59 11.62	− 0.71	− 0.21	− 4.04	+ 1.65	0.03	8.28	16 58 37.33	[30.95]	.....
	β Orionis	E.	11	5 9 6.90	+ 0.49	+ 0.08	0.25	− 0.23	0.03	6.96	5 8 35.99	30.97	− 0.05
	τ Orionis	E.	11	5 12 7.40	0.49	0.07	− 0.24	+ 0.22	0.03	7.47	5 11 36.44	31.03	+ 0.01
	β Tauri.....	E.	11	5 18 59.11	0.60	0.09	+ 0.12	+ 0.25	− 0.03	59.64	5 18 28.62	31.02	0.00
	Groom. 966, U. C ...	E.	6	5 23 42.42	+ 1.13	+ 0.17	+ 1.79	− 0.86	− 0.04	44.61	5 23 14.03	− 0 [30.58]	.....

$a_1 = -0^s.315$ (circle W.); $a_2 = -0^s.554$ (circle E.); $c = -0^s.203$ (circle E.).
Chronometer No. 1254 at $4^h\ 17^m$ *fast* $0^m\ 31^s.03 \pm 0^s.009$, *gaining* $0^s.037$ per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Jan. 14	ι Cassiopeæ, U. C	W.	11	2 19 25.25	− 0.90	− 0.07	+ 0.79	− 0.62	+ 0.06	24.51	2 18 52.25	− 0 [32.26]	.....
	ζ^2 Ceti.....	W.	6	2 22 7.24	0.54	0.04	− 0.07	0.25	0.06	6.40	2 21 34.37	32.03	− 0.04
	δ Ceti	W.	11	2 33 41.13	0.51	0.05	0.13	0.24	0.05	40.25	2 33 8.18	32.07	0.00
	γ^2 Ceti	W.	11	2 37 26.11	0.52	0.03	− 0.11	0.25	0.05	25.25	2 36 53.11	32.14	+ 0.07
	41 Arietis	W.	11	2 43 14.43	0.60	0.02	+ 0.07	0.27	0.04	13.65	2 42 41.63	32.02	− 0.05
	47 Cephei, U. C	W.	10	2 50 14.77	1.37	− 0.10	+ 1.89	1.28	0.04	13.95	2 49 42.20	[31.75]	.....
	α Ceti	W.	11	2 56 21.38	0.52	+ 0.01	− 0.10	0.25	0.04	20.56	2 55 48.54	32.02	− 0.05
	48 Cephei, U. C	W.	6	3 5 13.39	− 1.25	0.00	+ 1.62	− 1.13	+ 0.04	12.67	3 4 40.39	− 0 [32.28]	.....
	48 Cephei, U. C	E.	6	3 5 7.91	+ 1.25	0.00	+ 2.22	+ 0.93	+ 0.03	12.34	3 4 40.39	− 0 [31.95]	.....
	ξ Arietis	E.	11	3 8 18.41	0.58	0.00	0.03	0.22	0.03	19.27	3 7 47.14	32.13	+ 0.06
	α Persei.....	E.	11	3 15 59.80	0.71	0.00	+ 0.45	0.31	0.03	61.30	3 15 29.24	32.06	− 0.01
	ζ Tauri	E.	11	3 20 58.97	0.54	+ 0.04	− 0.09	0.21	+ 0.02	59.69	3 20 27.54	32.15	+ 0.08
	Tauri	E.	11	4 13 16.43	0.56	0.14	− 0.03	0.21	− 0.01	17.30	4 12 45.27	32.03	− 0.04
	ε Tauri.....	E.	11	4 21 54.80	0.57	0.13	+ 0.01	0.22	0.01	55.72	4 21 23.66	32.06	0.01
	Aldebaran	E.	11	4 29 20.64	0.56	0.11	− 0.02	0.21	0.01	21.49	4 28 49.46	32.03	− 0.04
	τ Tauri.....	E.	11	4 35 20.49	0.58	0.10	+ 0.05	0.22	0.02	21.42	4 34 49.30	32.12	+ 0.05
	9 Camelopard., U. C..	E.	6	4 42 16.14	+ 0.89	+ 0.11	+ 1.04	+ 0.51	− 0.02	18.67	4 41 46.34	− 0 [32.33]	.....

$a_1 = -0^s.415$ (circle W.); $a_2 = -0^s.567$ (circle E.); $c = +0^s.225$ (circle E.).
Chronometer No. 1254 at $4^h\ 2^m$ *fast* $0^m\ 32^s.07 \pm 0^s.010$, *gaining* $0^s.035$ per hour.

Transits of stars observed at St. John, Antigua, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Feb. 4	22 Camelopardalis ...	E.	9	5 4 35.09	+ 0.96	+ 0.31	— 1.72	+ 0.49	+ 0.01	35.14	6 5 14.10	[+60 38.96]	.....
	μ Geminorum.....	E.	9	5 14 48.96	0.59	0.10	— 0.08	0.19	0.01	49.77	6 15 29.06	39.29	+ 0.06
	α Argus*	E.	9	5 20 32.92	0.32	0.11	+ 1.19	0.29	+ 0.01	34.84	6 21 13.84	39.00	+ 0.35
	δ Canis Majoris.....	E.	9	6 2 41.74	0.44	0.16	+ 0.58	0.19	— 0.01	43.10	7 3 22.48	39.38	— 0.03
	Piazzi VII, 67.....	E.	7	6 17 22.80	0.96	0.33	— 1.66	0.47	0.02	22.88	7 18 2.27	[39.39]	.....
	α Geminorum.....	E.	9	6 26 2.96	0.63	0.16	— 0.24	0.21	0.02	3.70	7 26 43.15	39.45	— 0.10
	α Canis Minoris.....	E.	8	6 32 9.84	0.54	0.09	+ 0.15	0.17	0.02	10.77	7 32 50.19	39.42	— 0.07
	β Geminorum.....	E.	9	6 37 5.60	0.62	0.06	— 0.17	0.20	0.02	6.29	7 37 45.53	39.24	+ 0.11
	ϕ Geminorum.....	E.	9	6 45 16.23	0.60	0.05	0.15	0.20	0.02	16.91	7 45 56.36	39.45	— 0.10
	3 Ursæ Majoris.....	E.	6	6 59 52.78	+ 0.95	0.08	1.67	+ 0.47	0.03	52.58	8 0 32.04	[39.46]	.....
	3 Ursæ Majoris.....	W.	6	6 59 56.70	— 0.95	0.10	— 2.53	— 0.59	0.03	52.70	8 0 32.04	[39.34]	.....
	β Cancri	W.	9	7 9 10.37	0.55	0.06	+ 0.15	0.21	0,04	9.78	8 9 49.08	39.30	+ 0.05
	30 Monocerotis	W.	8	7 18 50.40	0.52	0.06	+ 0.41	0.21	0.04	50.10	8 19 29.44	39.34	0.01
	δ Cancri	W.	9	7 37 1.65	0.58	0.03	— 0.03	0.22	0.05	0.80	8 37 40.07	39.27	+ 0.08
	ϵ Hydræ	W.	9	7 39 35.36	— 0.55	+ 0.06	+ 0.21	— 0.21	— 0.05	34.82	8 40 14.26	+60 39.44	— 0.09

*With note by observer: "Not very good."

$a' = + 0^s.767$ (circle E.); $a'' = + 1^s.163$ (circle W.); $c = 0^s.192$ (+ with circle E.).

Chronometer No. 1295 at 5^h 35^m *slow* 1^h 0^m $39^s.35 \pm 0^s.017$, *gaining* $0^s.021$ per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Feb. 7	Groombridge, 966 ..	E.	4	4 22 33.34	+ 1.12	— 0.33	+ 0.46	— 0.69	+ 0.01	33.91	5 23 13.08	[+60 39.17]	.....
	ϵ Orionis	E.	8	4 29 17.52	0.52	0.15	— 0.04	0.18	0.01	17.68	5 29 56.45	38.77	0.00
	α Columbæ	E.	9	4 34 32.14	0.42	0.12	0.13	0.22	0.01	32.10	5 35 10.85	38.75	+ 0.02
	κ Orionis	E.	9	4 41 14.68	0.50	0.14	0.06	0.19	0.01	14.80	5 41 53.72	38.92	— 0.15
	α Orionis	E.	9	4 47 49.83	0.55	0.14	— 0.02	0.19	0.01	50.04	5 48 28.79	38.75	+ 0.02
	θ Aurigæ.....	E.	9	4 50 38.52	0.65	0.17	+ 0.06	0.24	0.01	38.83	5 51 17.53	38.70	+ 0.07
	22 Camelopardalis	E.	6	5 4 34.98	+ 0.96	0.31	+ 0.31	— 0.53	0.01	35.42	6 5 14.01	[38.59]	.....
	22 Camelopardalis	W.	6	5 4 36.81	— 0.96	0.20	— 0.77	+ 0.41	+ 0.01	35.30	6 5 14.01	[38.71]	.....
	μ Geminorum.....	W.	9	5 14 50.89	0.59	0.10	— 0.03	0.16	0.00	50.33	6 15 29.04	38.71	+ 0.06
	α Argus	W.	7	5 20 34.55	0.32	0.07	+ 0.53	0.24	0.00	34.93	6 21 13.77	38.84	— 0.07
	δ Geminorum.....	W.	5	6 12 6.60	0.59	0.20	— 0.03	0.16	0.00	5.94	7 12 44.73	38.79	— 0.02
	Piazzi VII, 67.....	W.	9	6 17 24.91	— 0.95	— 0.34	— 0.74	+ 0.39	— 0.01	23.26	7 18 2.23	[+60 38.97]	.....

$a' = — 0^s.140$ (circle E.); $a'' = + 0^s.342$ (circle W.); $c = 0^s.164$ (+ with circle W.).

Chronometer No. 1295 at 5^h 43^m *slow* 1^h 0^m $38^s.77 \pm 0^s.019$, *gaining* $0^s.010$ per hour.

Transits of stars observed at St. Thomas (Charlotte Amalie), by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	r.
1876.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Feb. 4	9 Camelopard., U. C..	W.	6	3 55 6.56	— 0.90	+ 0.02	+ 1.44	— 1.35	+ 0.10	5.87	4 41 45.77	+ 46 [39.90]	.....
	ι Aurigæ	W.	11	4 2 17.20	0.62	0.02	0.24	0.65	0.09	16.28	4 48 56.24	39.96	— 0.01
	ι Tauri	W.	10	4 9 3.21	0.58	0.01	+ 0.05	0.59	0.08	2.18	4 55 42.15	39.97	0.02
	11 Orionis	W.	7	4 10 51.18	0.56	0.01	— 0.04	0.57	0.08	50.10	4 57 30.11	40.01	— 0.06
	β Orionis	W.	11	4 21 57.22	0.49	+ 0.01	0.36	0.55	0.07	55.90	5 8 35.83	39.93	+ 0.02
	τ Orionis	W.	6	4 24 57.60	0.49	0.00	— 0.34	0.55	0.07	56.29	5 11 36.29	40.00	— 0.05
	β Tauri	W.	9	4 31 49.44	0.60	0.00	+ 0.16	0.62	0.06	48.44	5 18 28.49	40.05	— 0.10
	Groom. 966, U. C ...	W.	5	4 36 34.08	— 1.14	+ 0.01	+ 2.54	— 2.10	+ 0.06	33.45	5 23 13.23	+ 46 [39.78]	.....
	Groom. 966, U. C ...	E.	7	4 36 27.35	+ 1.14	0.00	+ 2.23	+ 1.95	+ 0.06	32.73	5 23 13.23	+ 46 [40.50]	.....
	δ Orionis	E.	9	4 39 0.85	0.51	0.00	— 0.22	0.51	0.06	1.71	5 25 41.48	39.77	+ 0.18
	ε Orionis	E.	11	4 43 15.78	0.51	+ 0.01	— 0.23	0.51	+ 0.05	16.63	5 29 56.48	39.85	+ 0.10
	51 Cephei, U. C	E.	6	5 55 5.14	4.04	+ 0.30	+13.40	10.50	— 0.02	33.36	6 42 13.26	[39.90]	.....
	ε Canis Majoris.....	E.	11	6 7 6.37	0.42	— 0.02	— 0.58	0.58	0.03	6.74	6 53 46.68	39.94	+ 0.01
	ζ Geminorum	E.	11	6 10 5.79	0.58	— 0.01	+ 0.03	0.54	0.03	6.90	6 56 46.88	39.98	— 0.03
	δ Canis Majoris.....	E.	11	6 16 42.09	0.43	+ 0.01	— 0.54	0.56	0.04	42.51	7 3 22.48	39.97	— 0.02
	δ Geminorum.....	E.	11	6 26 3.70	0.58	+ 0.02	+ 0.05	0.55	0.05	4.85	7 12 44.73	39.88	+ 0.07
	Piazzi VII, 67, U. C.	E.	11	6 31 18.27	0.95	— 0.05	+ 1.47	1.39	0.05	21.98	7 18 2.26	[40.28]	.....
	β Canis Minoris.....	E.	11	6 33 46.32	0.54	0.00	— 0.12	0.51	0.06	47.19	7 20 27.14	39.95	0.00
	α Geminorum.....	E.	11	6 40 1.67	0.62	+ 0.02	+ 0.20	0.60	0.06	3.05	7 26 43.15	40.10	— 0.15
	Procyon	E.	11	6 46 9.49	+ 0.53	0.00	— 0.15	+ 0.51	— 0.07	10.31	7 32 50.19	+ 46 39.88	+ 0.07

$a_1 = -0^s.789$ (circle W.); $a_2 = -0^s.692$ (circle E.); $c = +0^s.526$ (circle E.).
Chronometer No. 1254 at $5^h\ 36^m$ *slow* $46^m\ 39^s.95 \pm 0^s.014$, *gaining* $0^s.058$ per hour.

1876.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Feb. 7	9 Camelopard., U. C..	W.	11	3 55 8.98	— 0.90	+ 0.07	— 0.35	+ 0.94	+ 0.11	8.85	4 41 45.66	+ 46 [36.81]	.....
	ι Aurigæ	W.	11	4 2 19.47	0.62	0.06	0.06	0.45	0.10	19.40	4 48 56.20	36.80	+ 0.02
	ι Tauri.....	W.	11	4 9 5.34	0.58	+ 0.03	— 0.01	0.41	0.10	5.29	4 55 42.12	36.83	— 0.01
	11 Orionis	W.	11	4 10 53.24	0.56	— 0.03	+ 0.01	0.39	0.09	53.14	4 57 30.07	36.93	— 0.11
	β Orionis	W.	11	4 21 58.97	0.49	0.03	0.09	0.38	0.08	59.00	5 8 35.79	36.79	+ 0.03
	τ Orionis	W.	9	4 24 59.42	0.49	0.02	+ 0.08	0.38	0.08	59.45	5 11 36.26	36.81	+ 0.01
	β Tauri.....	W.	11	4 31 51.72	0.60	0.02	— 0.04	0.43	0.07	51.56	5 18 28.45	36.89	— 0.07
	Groom. 966, U. C ...	W.	4	4 36 36.49	— 1.14	— 0.01	— 0.62	+ 1.46	+ 0.07	36.25	5 23 13.08	+ 46 [36.83]	.....
	Groom. 966, U. C ...	E.	4	4 36 36.66	+ 1.14	+ 0.01	0.00	— 1.62	+ 0.07	36.26	5 23 13.08	+ 46 [36.82]	.....
	δ Orionis	E.	11	4 39 4.41	0.51	0.06	0.00	0.42	0.07	4.63	5 25 41.45	36.82	0.00
	ε Orionis	E.	11	4 43 19.35	0.51	0.07	0.00	0.42	0.06	19.57	5 29 56.45	36.88	— 0.06
	κ Orionis	E.	11	4 55 16.80	0.48	0.05	0.00	0.43	0.05	16.95	5 41 53.72	36.77	+ 0.05
	α Orionis	E.	11	5 1 51.76	+ 0.53	+ 0.06	0.00	— 0.42	+ 0.04	51.97	5 48 28.79	+ 46 36.82	0.00
	δ Geminorum.....	E.	9	6 26 7.65	+ 0.58	+ 0.11	+ 0.01	— 0.45	— 0.04	7.86	7 12 44.73	+ 46 36.87	— 0.05
	Piazzi VII, 67, U. C	E.	11	6 31 25.54	0.95	0.14	+ 0.21	1.16	0.05	25.63	7 18 2.23	[36.60]	.....
	β Canis Minoris.....	E.	11	6 33 50.23	0.54	0.14	— 0.02	0.42	0.05	50.42	7 20 27.15	36.73	+ 0.09
	ε Geminorum.....	E.	11	6 40 6.03	0.62	0.17	+ 0.03	0.50	0.06	6.29	7 26 43.15	36.86	— 0.04
	Procyon	E.	11	6 46 13.11	0.53	0.17	— 0.02	0.42	0.06	13.31	7 32 50.19	36.88	— 0.06
	β Geminorum.....	E.	11	6 51 8.61	+ 0.60	+ 0.20	+ 0.02	— 0.48	0.07	8.88	7 37 45.53	36.65	+ 0.17
	λ Ursæ Minoris, L. C	E.	2	7 0 15.46	— 8.58	— 2.86	— 5.11	+22.47	— 0.07	21.31	19 46 48.19	+ 46 [36.88]	.....

$a_1 = +0^s.193$ (circle W.); $a_2 = -0^s.001$ (circle E., 1st group); $a_2 = -0^s.099$ (circle E., 2d group); $c = -0^s.400$ (circle E.).
Chronometer No. 1254 at $5^h\ 45^m$ *slow* $46^m\ 36^s.82 \pm 0^s.012$, *gaining* $0^s.061$ per hour.

Transits of stars observed at Port Spain, Trinidad, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Feb. 15	38 Lyncis	E.	8	8 9 10.46	+ 0.62	+ 0.07	+ 1.13	+ 0.49	+ 0.01	12.78	9 11 9.78	+61 57.00	+ 0.02
	1 Draconis	E.	7	8 17 14.01	1.25	0.00	13.46	2.77	0.01	31.50	9 19 28.60	[57.10]	.....
	o Leonis	E.	9	8 32 35.66	0.56	— 0.02	0.00	0.40	0.01	36.61	9 34 33.72	57.11	— 0.09
	ε Leonis	E.	9	8 36 52.05	0.58	+ 0.02	+ 0.52	0.43	0.01	53.61	9 38 50.72	57.11	— 0.09
	μ Leonis	E.	9	8 43 46.05	0.59	— 0.03	0.62	0.44	0.01	47.68	9 45 44.67	56.99	+ 0.03
	α Leonis	E.	9	8 59 49.99	0.56	0.03	0.08	0.40	0.01	51.01	10 1 47.92	56.91	+ 0.11
	32 Ursæ Majoris	E.	6	9 7 2.75	+ 0.77	0.04	4.02	+ 0.95	0.02	8.47	10 9 5.43	[56.96]	.....
	32 Ursæ Majoris	W.	6	9 7 8.83	— 0.77	0.31	+ 2.05	— 1.05	0.02	8.77	10 9 5.43	[56.66]	.....
	ρ Leonis	W.	9	9 24 22.97	0.56	0.22	— 0.01	0.44	0.02	21.76	10 26 18.71	56.95	+ 0.07
	α Ursæ Majoris	W.	9	9 54 11.37	0.68	0.37	+ 1.74	0.94	0.02	11.14	10 56 7.90	56.76	+ 0.26
	ψ Ursæ Majoris	W.	8	10 0 47.55	0.64	0.36	0.82	0.62	0.02	46.77	11 2 43.88	57.11	— 0.09
	δ Leonis	W.	9	10 5 36.71	0.58	0.30	+ 0.20	0.46	0.02	35.59	11 7 32.70	57.11	— 0.09
	δ Crateris	W.	9	10 11 14.69	0.52	0.25	— 0.44	0.45	0.02	13.05	11 13 10.04	56.99	+ 0.03
	λ Draconis	W.	9	10 22 9.61	0.82	0.42	+ 2.58	1.27	0.03	9.71	11 24 6.97	[57.26]	.....
	υ Leonis	W.	9	10 28 42.02	— 0.54	— 0.30	— 0.19	— 0.43	+ 0.03	40.59	11 30 37.59	+61 57.00	+ 0.02

$a' = -2^s.009$ (circle E.); $a'' = -1^s.023$ (circle W.); $c = 0^s.413$ (+ with circle E.).
Chronometer No. 1295 at $7^h\ 12^m$ *slow* $1^h\ 1^m\ 57^s.02 \pm 0^s.016$, *losing* $0^s.008$ per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Feb. 16	ι Aurigæ	E.	7	3 46 56.70	+ 0.61	+ 0.07	+ 1.30	+ 0.39	+ 0.02	59.09	4 48 56.07	+61 56.98	— 0.05
	10 Camelopardalis	E.	9	3 50 22.00	0.72	0.08	4.46	0.65	0.02	27.93	4 52 24.97	57.04	0.11
	11 Orionis	E.	9	3 55 31.72	0.57	0.05	+ 0.23	0.34	0.02	32.93	4 57 29.95	57.02	0.09
	β Eridani	E.	9	3 59 49.02	0.53	0.04	— 0.81	0.32	0.02	49.12	5 1 46.13	57.01	— 0.08
	α Aurigæ	E.	9	4 5 32.49	0.65	0.05	+ 2.41	0.46	0.02	36.08	5 7 33.00	56.92	+ 0.01
	τ Orionis	E.	8	4 9 39.08	0.53	0.04	— 0.87	0.33	0.02	39.13	5 11 36.14	57.01	— 0.08
	β Tauri	E.	9	4 16 29.58	0.59	0.04	+ 1.01	0.37	0.02	31.61	5 18 28.33	56.72	+ 0.21
	Groombridge 966	E.	9	4 21 3.35	0.92	0.07	10.06	1.24	0.02	15.66	5 23 12.54	[56.88]	.....
	22 Camelopardalis	E.	6	5 3 7.92	+ 0.81	+ 0.06	7.04	+ 0.91	0.01	16.75	6 5 13.70	[56.95]	.....
	22 Camelopardalis	W.	7	5 3 12.30	— 0.81	— 0.09	6.65	— 1.03	0.01	17.03	6 5 13.70	[56.67]	.....
	μ Geminorum	W.	9	5 13 32.50	0.58	0.03	+ 0.60	0.39	0.01	32.11	6 15 28.95	56.84	+ 0.09
	α Argus	W.	9	5 19 21.48	0.41	— 0.01	— 4.02	0.60	0.01	16.45	6 21 13.54	57.09	— 0.16
	γ Geminorum	W.	9	5 28 38.24	0.57	+ 0.02	+ 0.27	0.38	0.01	37.59	6 30 34.35	56.76	+ 0.17
	15 Monocerotis	W.	9	5 32 14.40	0.56	— 0.02	— 0.03	0.37	0.01	13.43	6 34 10.37	56.94	— 0.01
	51 Cephei	W.	4	5 39 29.81	4.65	— 0.29	+55.25	7.56	+ 0.01	12.57	6 42 10.37	[57.80]	.....
	15 Argus	W.	9	7 0 22.75	0.50	+ 0.05	— 1.69	0.39	0.00	20.22	8 2 17.33	57.11	— 0.13
	β Cancri	W.	9	7 7 53.10	— 0.56	+ 0.06	— 0.05	— 0.37	— 0.01	52.17	8 9 49.11	+61 56.94	— 0.01

$a' = -2^s.897$ (circle E.); $a'' = -2^s.725$ (circle W.); $c = 0^s.343$ (+ with circle E.).
Chronometer No. 1295 at $6^h\ 26^m$ *slow* $1^h\ 1^m\ 56^s.93 \pm 0^s.021$, *gaining* $0^s.008$ per hour.

Transits of stars observed at St. Thomas (Charlotte Amalie), by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Feb. 15	β Tauri	W.	10	4 31 59.18	− 0.60	+ 0.10	+ 1.04	+ 0.30	+ 0.08	60.10	5 18 28.34	+46 28.94	− 0.07
	Groom. 966, U. C.	W.	11	4 36 27.47	1.14	0.30	+16.73	1.04	0.08	44.48	5 23 12.60	[28.12]	.....
	ε Orionis	W.	11	4 43 29.99	0.51	0.14	− 1.75	0.27	0.08	28.22	5 29 56.35	28.13	+ 0.04
	α Columbæ	W.	10	4 48 47.56	0.40	0.12	4.98	0.32	0.07	42.69	5 35 10.70	28.01	0.16
	κ Orionis	W.	11	4 55 27.93	0.48	0.15	2.48	0.27	0.07	25.46	5 41 53.62	28.16	+ 0.01
	α Orionis	W.	11	5 2 1.45	0.53	0.17	1.00	0.27	0.07	0.43	5 48 28.70	28.27	− 0.10
	ν Orionis	W.	11	5 14 2.99	0.56	0.18	− 0.33	0.28	0.06	2.62	6 0 30.83	28.21	− 0.04
	22 Camelopard., U. C.	W.	5	5 18 33.88	− 0.96	+ 0.30	+11.46	+ 0.77	+ 0.06	45.51	6 5 13.73	+46 [28.22]	.....
	30 Monocerotis	E.	10	7 33 1.05	+ 0.50	− 0.07	+ 0.17	− 0.31	− 0.01	1.33	8 19 29.45	+46 28.12	+ 0.05
	η Cancri	E.	11	7 39 5.80	0.58	0.09	− 0.02	0.33	0.01	5.93	8 25 34.12	28.19	− 0.02
	δ Cancri	E.	11	7 51 11.78	0.57	0.09	0.00	0.33	0.02	11.91	8 37 40.10	28.19	− 0.02
	ε Hydræ	E.	11	7 53 45.98	0.53	0.10	+ 0.09	0.31	0.02	46.17	8 40 14.30	28.13	+ 0.04
	63 Cancri	E.	11	8 25 37.33	0.57	0.13	0.00	0.33	0.04	37.40	9 12 5.51	23.11	+ 0.06
	ι Argus	E.	10	8 27 19.51	0.23	0.06	+ 0.85	0.60	0.04	19.89	9 13 48.08	28.19	− 0.02
	α Hydræ	E.	11	8 35 2.95	0.49	0.14	+ 0.20	0.31	0.04	3.15	9 21 31.28	28.13	+ 0.04
	θ Ursæ Majoris	E.	10	8 38 8.66	+ 0.73	− 0.20	− 0.41	− 0.51	− 0.04	8.23	9 24 36.47	+46 28.24	0.07

$a_1 = -5^s.195$ (circle W.); $a_2 = +0^s.450$ (circle E.); $c = -0^s.290$ (circle E.).
Chronometer No. 1254 at $7^h\ 13^m$ *slow* $46^m\ 28^s.16 \pm 0^s.012$, *gaining* $0^s.030$ per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Feb. 16	β Tauri	W.	11	4 32 1.58	− 0.60	− 0.08	− 0.08	+ 0.27	+ 0.11	1.20	5 18 28.33	+46 27.13	− 0.01
	ε Orionis	W.	11	4 43 29.42	0.51	0.07	+ 0.13	0.24	0.10	29.31	5 29 56.34	27.03	+ 0.09
	α Columbæ	W.	11	4 48 23.45	0.40	0.05	0.36	0.29	0.10	23.75	5 35 10.68	26.93	0.19
	κ Orionis	W.	11	4 55 26.56	0.48	0.08	0.18	0.24	0.09	26.51	5 41 53.60	27.09	+ 0.03
	α Orionis	W.	11	5 2 1.80	0.53	0.11	0.07	0.24	0.08	1.55	5 48 28.69	27.14	− 0.02
	ν Orionis	W.	11	5 14 3.97	0.56	0.11	+ 0.02	0.25	0.07	3.64	6 0 30.81	27.17	− 0.05
	22 Camelopard., U. C.	W.	7	5 18 47.83	− 0.96	− 0.18	− 0.83	+ 0.67	+ 0.07	46.60	6 5 13.70	+46 [27.10]	.....
	22 Camelopard., U. C.	E.	6	5 16 47.73	+ 0.96	− 0.18	− 0.99	− 0.78	+ 0.07	46.81	6 5 13.70	+46 [26.89]	.....
	δ Ursæ Minoris, L. C.	E.	5	5 25 26.29	− 2.35	+ 0.35	+ 7.33	+ 4.64	0.06	36.32	18 12 3.25	[26.93]	.....
	μ Geminorum	E.	11	5 29 1.69	+ 0.58	− 0.10	− 0.04	− 0.30	0.06	1.89	6 15 28.95	27.06	+ 0.06
	Canopus	E.	11	5 34 45.70	0.29	0.05	+ 0.70	0.45	0.05	46.24	6 21 13.53	27.29	− 0.17
	51 Cephei, U. C	E.	5	5 55 54.08	+ 4.04	− 0.30	− 8.71	− 5.75	+ 0.03	43.39	6 42 10.36	+46 [26.97]	.....
	α Geminorum	E.	11	6 40 15.71	+ 0.62	+ 0.05	− 0.09	− 0.33	− 0.01	15.95	7 26 43.11	+46 27.16	− 0.04
	Procyon	E.	11	6 46 22.68	0.53	0.04	+ 0.07	0.28	0.02	23.02	7 32 50.16	27.14	− 0.02
	β Geminorum	E.	11	6 51 18.25	+ 0.60	+ 0.04	− 0.06	− 0.31	0.02	18.50	7 37 45.49	26.99	+ 0.13
	λ Ursæ Minoris, L. C.	E.	5	7 0 3.59	− 8.58	− 0.64	+15.83	+14.83	0.03	25.00	19 46 52.12	[27.12]	.....
	3 Ursæ Majoris, U. C.	E.	11	7 14 5.44	+ 0.95	0.04	− 0.66	− 0.77	0.05	4.87	8 0 31.95	[27.08]	.....
	15 Argus	E.	10	7 16 49.85	0.44	0.03	+ 0.23	0.30	0.05	50.14	8 2 17.33	27.19	− 0.07
	β Cancri	E.	11	7 23 21.79	0.54	0.04	0.05	0.28	0.06	22.00	8 9 49.09	27.09	+ 0.03
	30 Monocerotis	E.	11	7 33 2.06	+ 0.50	− 0.04	+ 0.12	− 0.28	− 0.06	2.30	8 19 29.45	+46 27.15	− 0.03

$a_1 = +0^s.378$ (circle W.); $a_2 = +0^s.449$ (circle E, 1st group); $a_2 = +0^s.310$ (circle E, 2d group); $c = -0^s.257$ (circle E.).
Chronometer No. 1254 at $6^h\ 27^m$ *slow* $46^m\ 27^s \pm 0^s.016$, *gaining* $0^s.058$ per hour.

Transits of stars observed at Port Spain, Trinidad, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Feb. 17	σ^3 Ursæ Majoris.....	W.	9	7 57 36.31	— 0.79	— 0.13	+ 1.10	— 0.96	+ 0.04	35.57	8 59 32.58	[+61 57.01]	.....
	1 Draconis.....	W.	9	8 17 32.76	1.25	0.20	+ 3.35	2.58	0.03	32.11	9 19 28.60	[56.49]	.....
	e Leonis.....	W.	9	8 33 37.90	0.56	0.09	0.00	0.37	0.02	36.90	9 34 33.74	56.84	— 0.07
	ϵ Leonis.....	W.	9	8 36 54.94	0.58	0.10	+ 0.13	0.40	0.02	54.01	9 38 50.75	56.74	+ 0.03
	μ Leonis.....	W.	7	8 43 48.86	0.59	0.10	+ 0.16	0.41	0.01	47.93	9 45 44.69	56.76	0.01
	π Leonis.....	W.	9	8 51 45.71	0.56	0.09	— 0.02	0.37	+ 0.01	44.68	9 53 41.43	56.75	+ 0.02
	9 Draconis.....	W.	3	9 22 43.71	— 0.96	0.15	+ 1.93	— 1.54	— 0.01	42.98	10 24 38.75	[55.77]	.....
	9 Draconis.....	E.	3	9 22 38.73	+ 0.96	0.10	0.96	+ 1.38	0.01	41.92	10 24 38.75	[56.83]	.....
	41 Leonis Minoris	E.	9	9 34 44.68	0.58	0.03	0.06	0.35	0.02	45.62	10 36 42.41	56.79	— 0.02
	42 Leonis Minoris	E.	9	9 37 2.56	0.60	— 0.03	+ 0.10	0.38	0.02	3.59	10 39 0.32	56.73	+ 0.04
	l Leonis.....	E.	9	9 40 48.56	0.56	0.00	0.00	0.33	0.02	49.43	10 42 46.17	56.74	+ 0.03
	46 Leonis Minoris	E.	9	9 44 26.80	0.61	— 0.07	+ 0.12	0.39	0.03	27.91	10 46 24.73	56.82	— 0 05
	α Ursæ Majoris	E.	9	9 54 9.55	+ 0.68	— 0.07	+ 0.42	+ 0.69	— 0.03	11.24	10 56 7.94	+61 56.70	+ 0.07

$a' = -0^s.500$ (circle W.); $a'' = -0^s.249$ (circle E.); $c = 0^s.344$ (+ with circle E.).
Chronometer No. 1295 at 9^h 4m *slow* 1^h 1m $56^s.77 \pm 0^s.010$, *gaining* $0^s.038$ per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Feb. 18	δ Canis Majoris.....	E.	5	6 1 24.83	+ 0.49	— 0.07	+ 0.02	+ 0.41	— 0.03	25.65	7 3 22.34	+61 56.69	— 0.08
	λ Geminorum	E.	9	6 9 2.20	0.57	0.08	0.00	0.38	0.03	3.04	7 10 59.60	56.56	+ 0.05
	Piazzi VII, 67.....	E.	9	6 16 3.65	0.80	0.10	— 0.08	1.00	0.02	5.25	7 18 2.00	[56.75]	.....
	ϵ Geminorum.....	E.	9	6 24 45.51	0.60	0.08	— 0.01	0.43	0.02	46.43	7 26 43.10	56.67	— 0.06
	α Canis Minoris.....	E.	9	6 30 52.76	0.55	0.08	0.00	0.36	0.02	53.57	7 32 50.15	56.58	+ 0.03
	ϕ Geminorum.....	E.	9	6 43 58.87	0.59	0.09	— 0.01	0.41	0.02	59.75	7 45 56.34	56.59	0.02
	δ Cancri	E.	9	7 35 42.70	0.57	0.09	0.00	0.38	0.01	43.55	8 37 40.12	56.57	+ 0.04
	σ^3 Ursæ Majoris	E.	6	7 57 34.55	+ 0.79	— 0.13	— 0.07	+ 0.95	0.01	36.08	8 59 32.58	[56.50]	.....
	σ^3 Ursæ Majoris.....	W.	6	7 57 37.32	— 0.79	0.00	+ 0.72	— 1.07	0.01	36.17	8 59 32.58	[56.41]	.....
	θ Hydræ.....	W.	9	8 6 0.86	0.55	0.00	— 0.05	0.40	— 0.01	59.85	9 7 56.49	56.64	— 0.03
	41 Leonis Minoris	W.	9	9 34 46.87	0.58	— 0.04	+ 0.08	0.44	+ 0.01	45.90	10 36 42.43	56.53	+ 0.08
	42 Leonis Minoris	W.	9	9 37 4.92	0.60	0.05	+ 0.13	0.47	0.01	3.94	10 38 0.33	56.39	+ 0.22
	l Leonis.....	W.	9	9 40 50.50	0.56	0.06	0.00	0.41	0.01	49.48	10 42 46.18	56.70	— 0.09
	χ Leonis.....	W.	9	9 56 43.44	0.55	0.13	— 0.02	0.41	0.01	42.34	10 58 38.98	56.64	0.03
	δ Leonis.....	W.	9	10 5 37.08	0.58	0.12	+ 0.06	0.43	0.01	36.02	11 7 32.74	56.72	— 0.11
	λ Draconis.....	W.	9	10 22 11.58	— 0.82	— 0.13	+ 0.83	— 1.19	+ 0.01	10.28	11 24 7.08	[+61 56.80]	.....

$a' = +0^s.034$ (circle E.); $a'' = -0^s.328$ (circle W.); $c = 0^s.385$ (+ with circle E.).
Chronometer No. 1295 at 8^h 57m *slow* 1^h 1m $56^s.61 \pm 0^s.018$, *losing* $0^s.009$ per hour.

Transits of stars observed at St. Thomas (Charlotte Amalie), by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Feb. 17	σ^2 Canori	E.	10	8 0 16.75	+ 0.62	— 0.03	— 0.06	— 0.34	+ 0.06	17.02	8 46 42.66	+46 25.64	+ 0.11
	ι Ursæ Majoris	E.	11	8 4 19.62	0.71	0.04	0.17	0.44	0.07	19.75	8 50 45.56	25.81	— 0.06
	κ Ursæ Majoris	E.	11	8 8 46.12	0.70	0.04	0.16	0.43	0.07	46.96	8 55 11.90	25.64	+ 0.11
	σ^3 Ursæ Majoris, U. C.	E.	8	8 13 7.20	0.92	0.05	— 0.44	0.74	0.06	6.95	8 59 32.58	[25.63]	.....
	κ Canori	E.	3	8 14 37.45	0.55	0.03	+ 0.63	0.30	0.06	37.76	9 1 3.63	25.87	— 0.12
	36 Lyncis	E.	11	8 19 18.04	0.68	0.02	— 0.13	0.40	0.06	18.23	9 5 44.07	25.84	— 0.09
	83 Canori	E.	11	8 25 39.51	0.57	0.02	0.00	0.30	0.05	39.81	9 12 5.52	25.71	+ 0.04
	1 Draconis, U. C	E.	8	8 33 4.58	1.70	0.06	— 1.40	2.05	0.04	2.81	9 19 28.59	[25.78]	.....
	α Hydræ	E.	7	8 35 5.22	+ 0.49	— 0.02	+ 0.10	— 0.29	+ 0.03	5.53	9 21 31.30	+46 25.77	— 0.02
	γ^1 Leonis	E.	10	9 26 44.21	+ 0.58	+ 0.03	— 0.01	— 0.31	— 0.02	44.48	10 13 10.09	+46 25.61	+ 0.14
	ρ Leonis	E.	10	9 39 52.58	0.54	0.02	+ 0.04	0.29	0.04	52.85	10 26 18.73	25.88	— 0.13
	42 Leonis Minoris	E.	10	9 52 34.38	0.62	0.03	— 0.06	0.34	0.05	34.58	10 39 0.30	25.72	+ 0.03
	l Leonis	E.	11	9 56 20.07	0.55	0.03	+ 0.03	0.30	0.06	20.32	10 42 46.16	25.84	— 0.09
	Groom. 1706, U. C	E.	4	10 3 43.84	1.34	0.10	— 1.07	1.45	0.07	42.69	10 50 8.52	[25.83]	.....
	α Ursæ Majoris	E.	11	10 9 42.41	+ 0.84	+ 0.08	— 0.37	— 0.63	— 0.07	42.26	10 56 7.94	+46 25.68	+ 0.07

$a_1 = +0^s.221$ (circle E., 1st group); $a_2 = +0^s.247$ (circle E., 2d group); $c = -0^s.270$ (circle E.).
Chronometer No. 1254 at 9^h 6m *slow* 46m 25s.75 ± 0s.018, *gaining* 0s.069 per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Feb. 18	22 Camelopard., U. C.	W.	11	5 18 51.05	— 0.96	— 0.27	— 1.51	+ 0.73	+ 0.23	49.27	6 5 13.62	+46 [24.35]	.....
	δ Ursæ Minoris, L. C.	W.	4	5 25 30.28	+ 2.35	+ 0.43	+11.15	— 4.36	0.22	40.07	18 12 3.79	[23.72]	.....
	μ Geminorum	W.	11	5 29 4.72	— 0.58	— 0.12	— 0.05	+ 0.28	0.22	4.47	6 15 28.93	24.46	+ 0.05
	γ Geminorum	W.	11	5 44 10.01	0.56	0.12	+ 0.02	0.27	0.20	9.82	6 30 34.33	24.51	0.00
	51 Cephei, U. C	W.	4	5 55 58.12	— 4.04	— 0.97	—13.25	+ 5.36	+ 0.19	45.41	6 42 9.83	+46 [24.42]	.....
	δ Geminorum	E.	2	6 26 19.76	+ 0.58	— 0.03	— 0.02	— 0.32	+ 0.16	20.13	7 12 44.68	+46 24.55	— 0.04
	Regulus	E.	11	9 15 23.04	0.55	+ 0.05	+ 0.03	0.31	— 0.02	23.34	10 1 47.94	24.60	— 0.09
	32 Ursæ Majoris, U. C.	E.	5	9 22 41.27	0.89	0.08	— 0.60	0.72	0.03	40.89	10 9 5.48	[24.59]	.....
	γ^1 Leonis	E.	11	9 26 45.49	0.58	+ 0.03	0.01	0.32	0.03	45.74	10 13 10.10	24.36	+ 0.15
	β Leonis Minoris	E.	11	9 34 20.47	0.64	— 0.08	0.14	0.38	0.04	20.47	10 20 45.02	24.55	— 0.04
	9 Draconis, U. C	E.	6	9 38 15.66	1.21	0.11	— 1.20	1.26	0.04	14.26	10 24 38.78	[24.52]	.....
	ρ Leonis	E.	10	9 39 54.01	0.54	0.03	+ 0.05	0.30	0.04	54.23	10 26 18.74	24.51	0.00
	42 Leonis Minoris	E.	11	9 52 35.60	0.62	0.02	— 0.09	0.35	0.06	35.70	10 38 60.31	24.61	— 0.10
	l Leonis	E.	11	9 56 21.45	0.55	— 0.02	+ 0.04	0.31	0.06	21.65	10 42 46.18	24.53	— 0.02
	α Ursæ Majoris	E.	8	10 9 43.83	0.84	+ 0.05	— 0.50	0.64	0.08	43.50	10 56 7.97	24.47	+ 0.04
	ψ Ursæ Majoris	E.	10	10 16 19.51	0.68	0.05	0.21	0.42	0.08	19.53	11 2 43.91	24.38	+ 0.13
	δ Leonis	E.	8	10 21 7.96	+ 0.58	+ 0.05	— 0.02	— 0.32	— 0.09	8.16	11 7 32.74	+46 24.58	— 0.07

$a_1 = +0^s.684$ (circle W.); $a_2 = +0^s.335$ (circle E.); $c = -0^s.278$ (circle E.).
Chronometer No. 1254 at 8^h 58m *slow* 46m 24s.51 ± 0s.016, *gaining* 0s.064 per hour.

Transits of stars observed at Bridgetown, Barbados, by Lieut. Commander F. M. Green, U. S. N., to determine correction of sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Mar. 12	δ Geminorum.....	E.	9	6 3 16.60	+ 0.59	+ 0.06	0.00	— 0.13	+ 0.02	17.14	7 12 44.40	+ 69 27.26	+ 0.14
	Piazzi VII, 67.....	E.	9	6 8 33.18	0.86	+ 0.03	+ 0.03	0 34	0.02	33.78	7 18 1.18	[27.40]	.....
	α Geminorum.....	E.	9	6 17 14.88	0.62	— 0.02	+ 0.01	0.14	0.02	15.37	7 26 42.83	27.46	— 0.06
	α Canis Minoris.....	E.	9	6 23 22.09	0.55	0.04	0.00	0.12	0.02	22.50	7 32 49.90	27.40	0.00
	β Geminorum.....	E.	9	6 28 17.40	0.60	0.07	0.00	0.14	0.02	17.81	7 37 45.23	27.42	— 0.02
	φ Geminorum.....	E.	9	6 36 28.28	0.55	0.07	0.00	0.13	0.02	28.65	7 45 56.10	27.45	— 0.05
	3 Ursæ Majoris.....	E.	6	6 51 3.39	+ 0.86	0.09	+ 0.03	— 0.34	0.02	3.87	8 0 31.27	[27.40]	.....
	3 Ursæ Majoris.....	W.	7	6 51 3.46	— 0.86	0.03	+ 0.91	+ 0.22	0.02	3.72	8 0 31.27	[27.55]	.....
	β Cancri	W.	9	7 0 22.03	0.57	0.03	— 0.02	0.08	0.02	21.51	8 9 48.91	27.40	0.00
	30 Monocerotis	W.	9	7 10 2.37	0.53	0.04	+ 0.11	0.05	0.01	1.97	8 19 29.29	27.32	+ 0.08
	Groombridge 1446..	W.	9	7 16 30.67	0.97	0.07	1.26	0.30	0.01	31.20	8 25 58.46	[27.26]	.....
	δ Cancri	W.	9	7 28 13.11	0.57	0.06	+ 0.04	0.09	0.01	13.62	8 37 40.00	27.38	+ 0.02
	a^2 Cancri	W.	9	7 42 17.17	0.56	0.02	0.00	0.03	0.01	16.68	8 51 43.98	27.30	+ 0.10
	κ Cancri	W.	9	7 51 36.65	— 0.56	— 0.02	— 0.01	+ 0.08	+ 0.01	36.15	9 1 3.56	+ 69 27.41	— 0.01

$a' = -0^s.014$ (circle E.); $a'' = -0^s.396$ (circle W.); $c = 0^s.102$ (+ with circle W.).
Chronometer No. 1295 at $9^h\ 3^m$ *slow* $1^h\ 9^m\ 27^s.40 \pm 0^s.017$, *gaining* $0^s.008$ per hour.

1876.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
Mar. 13	ε Canis Majoris	W.	9	5 44 19.03	— 0.47	— 0.13	+ 0.17	+ 0.09	— 0.04	18.65	6 53 46.11	+ 69 27.46	+ 0.06
	ζ Geminorum.....	W.	9	5 47 19.83	0.58	0.17	— 0.04	0.09	0.04	19.09	6 56 46.50	27.41	+ 0.11
	δ Canis Majoris.....	W.	9	5 53 54.71	0.47	0.14	+ 0.16	0.09	0.04	54.31	7 3 21.96	27.65	— 0.13
	λ Geminorum.....	W.	9	6 1 32.47	0.57	0.16	— 0.02	0.08	0.04	31.76	7 10 59.30	27.54	— 0.02
	δ Geminorum.....	W.	9	6 3 17.62	0.59	0.16	0.04	0.09	0.03	16.89	7 12 44.38	27.49	+ 0.03
	Piazzi VII, 67.....	W.	9	6 8 35.07	0.86	0.23	— 0.51	0.20	0.03	33.64	7 18 1.14	[27.50]	.....
	α Canis Minoris.....	W.	9	6 23 22.89	0.55	0.14	+ 0.03	0.07	0.03	22.27	7 32 49.89	27.62	— 0.10
	3 Ursæ Majoris.....	W.	6	6 51 5.03	— 0.86	0.14	— 0.51	+ 0.20	0.03	3.69	8 0 31.24	[27.55]	.....
	3 Ursæ Majoris.....	E.	6	6 51 4.86	+ 0.86	0.25	— 1.57	— 0.32	0.03	3.55	8 0 31.24	[27.69]	.....
	β Cancri	E.	9	7 0 21.10	0.57	0.15	+ 0.04	0.12	0.02	21.42	8 9 48.91	27.49	+ 0.03
	31 Lyncis	E.	9	7 4 55.63	0.68	0.18	— 0.48	0.16	0.02	55.47	8 14 22.83	27.36	+ 0.16
	30 Monocerotis	E.	9	7 10 1.19	0.53	0.13	+ 0.19	0.11	0.02	1.65	8 19 29.28	27.63	— 0.11
	Groombridge 1446..	E.	9	7 16 32.91	0.97	0.25	— 2.18	0.41	0.02	31.02	8 25 58.42	[27.40]	.....
	δ Cancri	E.	9	7 28 12.25	0.57	0.14	— 0.07	0.12	0.02	12.47	8 37 39.99	27.52	0.00
	ζ Hydræ.....	E.	9	7 39 24.05	0.55	0.13	+ 0.08	0.12	0.02	24.41	8 48 51.98	27.57	— 0.05
	a^2 Cancri	E.	9	7 42 16.20	+ 0.56	— 0.13	+ 0.01	— 0.12	— 0.02	16.50	8 51 43.96	+ 69 27.46	+ 0.06

$a' = +0^s.223$ (circle W.); $a'' = +0^s.686$ (circle E.); $c = 0^s.094$ (+ with circle W.).
Chronometer No. 1295 at $9^h\ 16^m$ *slow* $1^h\ 9^m\ 27^s.52 \pm 0^s.017$, *losing* $0^s.011$ per hour.

Transits of stars observed at Port Spain, Trinidad, British West Indies, by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Mar. 12	η Cancri	E.	11	7 25 52.85	+ 0.57	− 0.07	− 2.55	− 0.28	+ 0.06	50.58	8 25 33.97	+59 43 39	− 0.06
	δ Cancri	E.	11	7 37 58.24	0.56	0.06	− 1.96	0.28	0.05	56.55	8 37 39.99	43.44	0.11
	ϵ Hydræ	E.	11	7 40 29.58	0.54	0.04	+ 0.90	0.26	0.05	30.77	8 40 14.18	43.41	− 0.08
	σ^2 Cancri	E.	11	7 46 64.44	0.59	0.02	− 5.46	0.30	0.04	59.29	8 46 42.56	43.27	+ 0.06
	ι Ursæ Majoris	E.	11	7 51 14.10	0.64	0.01	12.43	0.40	0.04	1.94	8 50 45.38	43.44	− 0.11
	κ Ursæ Majoris	E.	11	7 55 40.22	0.64	− 0.02	11.98	0.39	0.04	28.51	8 55 11.76	43.25	+ 0.08
	σ^2 Ursæ Majoris, U. C.	E.	8	7 59 78.51	0.77	+ 0.03	29.56	0.69	0.04	49.10	8 59 32.24	[43.14]	.....
	κ Cancri	E.	11	8 1 20.07	0.55	0.02	0.13	0.27	0.04	20.28	9 1 3.56	43.28	+ 0.05
	1 Draconis, U. C	E.	4	8 19 134.68	+ 1.23	+ 0.07	−89.86	− 1.85	+ 0.03	44.30	9 19 27.70	+59 [43.40]	.....
	1 Draconis, U. C	W.	5	8 19 123.89	− 1.23	+ 0.20	−90.13	+ 1.57	+ 0.03	44.33	9 19 27.70	+59 [43.37]	.....
	θ Ursæ Majoris	W.	11	8 24 68.02	0.66	+ 0.12	−14.58	0.36	+ 0.02	53.28	9 24 36.41	43.13	+ 0.20
	ρ Leonis	W.	11	9 26 35.69	0.55	− 0.05	+ 0.16	0.22	− 0.01	35.46	10 26 18.85	43.39	− 0.06
	42 Leonis Minoris	W.	11	9 39 23.09	0.59	0.07	− 5.57	0.26	0.02	17.10	10 39 0.48	43.38	− 0.05
	l Leonis	W.	11	9 43 3.48	0.55	0.01	0.13	0.23	0.02	3.00	10 42 46.33	43.33	0.00
	α Ursæ Majoris	W.	11	9 56 48.10	0.72	− 0.01	22.83	0.48	0.03	24.99	10 56 8.23	43.24	+ 0.09
	ψ Ursæ Majoris	W.	11	10 3 11.87	0.63	+ 0.01	10.82	0.31	0.03	0.71	11 2 44.15	43.44	− 0.11
	δ Leonis	W.	11	10 7 52.56	0.57	+ 0.02	− 2.64	0.24	0.04	49.57	11 7 32.97	43.40	− 0.07
	δ Crateris	W.	11	10 13 21.54	0.50	0.00	+ 5.81	0.23	0.04	27.04	11 13 10.30	43.26	+ 0.07
	ι Leonis	W.	11	10 17 46.75	− 0.55	0.00	− 0.13	+ 0.23	− 0.04	46.26	11 17 29.61	+59 43.35	− 0.02

$a_1 = +13^s.412$ (circle E.); $a_2 = +13^s.452$ (circle W.); $c = -0^s.242$ (circle E.).
Chronometer No. 1254 at $9^h\ 6^m$ *slow* $59^m\ 43^s.33 + 0^s.015$, *gaining* $0^s.035$ per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Mar. 13	η Cancri	W.	11	7 25 54.29	− 0.57	+ 0.07	− 2.37	+ 0.12	+ 0.07	51.61	8 25 33.96	+59 42.35	− 0.08
	δ Cancri	W.	10	7 37 59.83	0.56	0.06	− 1.82	0.13	0.07	57.70	8 37 39.98	42.28	0.01
	ϵ Hydræ	W.	11	7 40 31.34	0.54	0.03	+ 0.83	0.11	0.06	31.83	8 40 14.17	42.34	− 0.07
	σ^2 Cancri	W.	11	7 47 5.85	0.59	0.03	− 5.06	0.13	0.06	0.42	8 46 42.55	42.13	+ 0.14
	ι Ursæ Majoris	W.	8	7 51 14.99	0.64	0.05	11.53	0.17	0.06	3.10	8 50 45.37	42.27	0.00
	κ Ursæ Majoris	W.	10	7 55 41.07	0.64	0.05	11.11	0.17	0.05	29.57	8 55 11.75	42.18	+ 0.09
	σ^2 Ursæ Majoris, U. C.	W.	8	7 59 77.65	0.77	0.06	27.37	0.29	0.05	49.91	8 59 32.21	[42.30]	.....
	κ Cancri	W.	11	8 1 21.75	0.55	0.04	− 0.12	0.12	0.05	21.29	9 1 3.55	42.26	+ 0.01
	θ Hydræ	W.	9	8 8 12.75	0.54	0.04	+ 1.69	0.11	0.05	14.10	9 7 56.41	42.31	− 0.04
	α Hydræ	W.	11	8 21 45.27	0.52	0.06	+ 4.04	0.11	0.04	49.00	9 21 31.25	42.25	+ 0.02
	θ Ursæ Majoris	W.	11	8 24 67.92	− 0.66	+ 0.08	−13.44	+ 0.18	+ 0.04	54.12	9 24 36.39	+59 42.27	0.00
	42 Leonis Minoris	E.	11	9 39 22.76	+ 0.59	+ 0.13	− 5.13	− 0.18	− 0.01	18.16	10 39 0.48	+59 42.32	− 0.05
	l Leonis	E.	6	9 43 3.65	0.55	0.12	0.12	0.16	0.02	4.02	10 42 46.33	42.31	− 0.04
	Groom. 1706, U. C.	E.	10	9 50 83.41	1.02	0.27	−57.19	0.76	0.02	26.73	10 50 8.90	[42.17]	.....
	χ Leonis	E.	11	9 58 55.95	0.55	0.10	+ 0.58	0.15	0.03	57.00	10 58 39.16	42.16	+ 0.11
	ψ Ursæ Majoris	E.	11	10 3 11.42	0.63	0.12	− 9.96	0.21	0.03	1.97	11 2 44.16	42.19	0.08
	δ Leonis	E.	11	10 7 52.69	0.57	0.10	− 2.41	0.16	0.03	50.76	11 7 32.97	42.21	+ 0.06
	δ Crateris	E.	11	10 13 22.26	0.50	0.09	+ 5.30	0.16	0.04	27.95	11 13 10.30	42.35	− 0.08
	ι Leonis	E.	11	10 17 47.02	0.55	0.12	− 0.12	0.16	0.04	47.37	11 17 29.61	42.24	+ 0.03
	τ Leonis	E.	11	10 21 51.26	0.54	0.11	+ 1.52	0.15	0.04	53.24	11 21 35.57	42.33	− 0.06
	λ Draconis, U. C	E.	11	10 24 55.83	+ 0.80	+ 0.13	−31.18	− 0.44	− 0.04	25.10	11 24 7.54	+59 [42.44]	.....

$a_1 = +12^s.440$ (circle W.); $a_2 = +12^s.387$ (circle E.); $c = -0^s.132$ (circle E.).
Chronometer No. 1254 at $9^h\ 18^m$ *slow* $59^m\ 42^s.27 \pm 0^s.011$, *gaining* $0^s.038$ per hour.

Transits of stars observed at Bridgetown, Barbados, by Lieut. Commander F. M. Green, U. S. N., to determine correction of sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Mar. 14	μ Geminorum	E.	9	5 6 0.67	+ 0.58	+ 0.03	— 0.23	— 0.12	+ 0.06	0.99	6 15 28.55	+ 69 27.56	+ 0.02
	8 Monocerotis	E.	9	5 7 44.51	0.55	0.03	+ 0.19	0.12	0.06	45.22	6 17 12.82	27.60	— 0.02
	α Argus	E.	9	5 11 43.04	0.37	0.03	+ 1.88	0.19	0.06	45.19	6 21 12.66	27.47	+ 0.11
	γ Geminorum	E.	9	5 21 5.87	0.57	0.05	— 0.08	0.12	0.06	6.35	6 30 33.98	27.63	— 0.05
	15 Monocerotis	E.	9	5 24 41.82	0.57	0.06	+ 0.06	0.12	0.06	42.45	6 34 10.01	27.56	+ 0.02
	ξ Geminorum	E.	9	5 28 52.71	0.56	0.06	0.00	0.12	0.06	53.27	6 38 20.84	27.57	+ 0.01
	Piazzi VII, 67	E.	9	6 8 35.59	+ 0.86	+ 0.33	— 2.85	— 0.32	0.04	33.65	7 18 1.09	[27.44]	.....
	α Canis Minoris	W.	9	6 23 22.70	— 0.55	— 0.14	+ 0.16	+ 0.08	0.04	22.29	7 32 49.88	27.59	— 0.01
	β Geminorum	W.	9	6 28 18.67	0.60	0.14	— 0.38	0.09	0.04	17.68	7 37 45.20	27.52	+ 0.06
	β Cancri	W.	9	7 0 21.93	0.57	0.14	+ 0.07	0.08	0.03	21.40	8 9 48.90	27.50	+ 0.08
	31 Lyncis	W.	9	7 4 56.83	0.68	0.22	— 0.87	0.10	0.03	55.19	8 14 22.81	27.62	— 0.04
	30 Monocerotis	W.	9	7 10 1.90	0.53	0.17	+ 0.36	0.08	0.02	1.66	8 19 29.27	27.61	— 0.03
	Groombridge 1446	W.	6	7 16 35.52	0.97	0.28	— 3.97	0.28	0.02	30.60	8 25 58.37	[27.77]	.....
	δ Cancri	W.	9	7 28 13.17	0.57	0.17	— 0.12	0.08	0.02	12.41	8 37 39.98	27.57	+ 0.01
	ϵ Hydræ	W.	9	7 30 47.00	0.55	0.13	+ 0.14	0.08	0.02	46.56	8 40 14.16	27.60	— 0.02
	ζ Hydræ	W.	7	7 39 24.84	— 0.55	— 0.13	+ 0.15	+ 0.08	+ 0.02	24.41	8 48 51.98	+ 69 27.57	+ 0.01

$a = + 1^s.248$; $c = 0^s.095$ (+ with circle W.).

Chronometer No. 1295 at $8^h\ 29^m$ *slow* $1^h\ 9^m\ 27^s.58 \pm 0^s.007$, *gaining* $0^s.019$ per hour.

Transits of stars observed at Port Spain, Trinidad, British West Indies, by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Mar. 14	η Canori	W.	11	7 25 53.55	— 0.57	— 0.03	— 0.48	+ 0.20	+ 0.04	52.71	8 25 33.95	+ 59 41.24	+ 0.07
	δ Canori	W.	11	7 37 59.37	0.56	0.06	— 0.37	0.20	0.04	58.62	8 37 39.97	41.35	— 0.04
	ϵ Hydræ	W.	10	7 40 33.03	0.54	0.06	+ 0.17	0.19	0.03	32.82	8 40 14.16	41.34	— 0.03
	θ Hydræ	W.	3	8 8 15.24	0.54	0.06	0.35	0.19	0.01	15.15	9 7 56.40	41.25	+ 0.06
	ι Argus	W.	6	8 14 1.80	0.37	0.04	4.54	0.37	0.01	6.31	9 13 47.64	41.33	— 0.02
	α Hydræ	W.	6	8 21 49.57	0.52	0.06	0.82	0.19	+ 0.01	50.01	9 21 31.24	41.23	+ 0.08
	π Leonis	W.	11	8 54 0.45	0.55	0.07	+ 0.09	0.19	— 0.01	0.10	9 53 41.46	41.36	— 0.05
	Regulus	W.	11	9 2 7.14	0.55	0.07	— 0.08	0.20	0.02	6.62	10 1 47.99	41.37	0.06
	γ^1 Leonis	W.	11	9 13 29.78	0.57	0.07	0.46	0.20	0.03	28.85	10 13 10.19	41.34	0.03
	β Leonis Minoris	W.	7	9 21 5.70	— 0.61	— 0.08	— 1.42	+ 0.24	— 0.03	3.80	10 20 45.14	+ 59 41.34	— 0.03
	ρ Leonis	E.	11	9 26 37.14	+ 0.55	— 0.07	+ 0.03	— 0.23	— 0.04	37.38	10 26 18.85	+ 59 41.47	— 0.16
	α Ursæ Majoris	E.	3	9 56 30.64	0.72	+ 0.05	— 3.93	0.50	0.06	26.92	10 56 8.22	41.30	+ 0.01
	ψ Ursæ Majoris	E.	10	10 3 4.63	0.63	+ 0.05	1.86	0.33	0.06	3.06	11 2 44.16	41.10	0.21
	δ Leonis	E.	10	10 7 51.86	0.57	0.00	— 0.45	0.25	0.06	51.67	11 7 32.97	41.30	+ 0.01
	δ Crateris	E.	11	10 13 27.76	0.50	0.00	+ 1.00	0.24	0.07	28.95	11 13 10.30	41.35	— 0.04
	ι Leonis	E.	11	10 17 48.08	0.55	+ 0.02	— 0.02	0.24	0.07	48.32	11 17 29.62	41.30	+ 0.01
	τ Leonis	E.	11	10 21 53.72	0.54	0.02	+ 0.29	0.23	0.07	54.27	11 21 35.58	41.31	0.00
	κ Draconis, U. C.	E.	10	10 24 31.94	+ 0.80	+ 0.03	— 5.83	— 0.68	— 0.07	26.19	11 24 7.54	+ 59 [41.35]	.....

$a_1 = + 2^s.514$ (circle W.); $a_2 = + 2^s.318$ (circle E.); $c = - 0^s.212$ (circle E.).
Chronometer No. 1254 at $8^h\ 31^m$ *slow* $59^m\ 41^s.31 \pm 0^s.013$; *gaining* $0^s.038$ per hour.

Transits of stars observed at St. Pierre, Martinique, by Lieut. Commander F. M. Green, U. S. N., to determine the correction of sideral chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Mar. 25	o Leonis	W.	9	8 31 23.82	− 0.56	+ 0.04	0.00	− 0.36	+ 0.03	22.97	9 34 33.65	+63 10.68	0.00
	ε Leonis	W.	9	8 35 40.82	0.59	0.06	− 0.01	0.39	0.03	39.92	9 38 50.67	10.75	− 0.07
	μ Leonis	W.	9	8 42 34.92	0.60	0.07	0.01	0.40	0.03	34.01	9 45 44.63	10.62	+ 0.06
	Groombridge 1586	W.	7	8 44 12.85	1.00	0.11	0.18	1.26	0.03	10.55	9 47 21.57	[11.02]	.....
	π Leonis	W.	9	8 50 31.53	0.55	0.06	− 0.01	0.36	0.03	30.70	9 53 41.43	10.73	− 0.05
	α Leonis	W.	9	8 53 38.02	0.56	0.10	0.00	0.36	0.02	37.22	10 1 47.94	10.72	− 0.04
	ξ Leonis	W.	9	9 6 39.89	0.59	0.14	− 0.01	0.39	0.02	39.06	10 19 49.61	10.55	+ 0.13
	9 Draconis	W.	4	9 21 30.68	1.11	0.26	0.23	1.51	0.01	28.10	10 24 38.51	[10.41]	.....
	35 Ursæ Majoris	W.	6	9 31 7.09	− 0.91	0.22	0.15	− 1.03	0.01	5.23	10 34 15.81	[10.58]	.....
	35 Ursæ Majoris	E.	6	9 31 3.43	+ 0.91	0.03	− 0.52	+ 0.91	+ 0.01	4.77	10 34 15.81	[11.04]	.....
	χ Ursæ Majoris	E.	9	10 36 21.29	0.69	0.20	+ 0.03	0.31	− 0.02	22.50	11 39 33.12	10.62	+ 0.06
	β Leonis	E.	9	10 39 34.50	0.55	0.12	0.00	0.33	0.02	35.48	11 42 46.19	10.71	− 0.03
	β Virginis	E.	8	10 41 4.47	0.54	0.11	+ 0.05	0.32	0.02	5.47	11 44 16.12	10.65	+ 0.03
	γ Ursæ Majoris	E.	9	10 44 10.00	0.73	0.12	− 0.24	0.54	0.02	11.13	11 47 21.86	10.73	− 0.05
	Groombridge 1852	E.	6	10 55 52.51	+ 1.17	+ 0.19	− 0.91	+ 1.48	− 0.03	54.41	11 59 4.61	[+63 10.20]	.....

$a' = +0^s.061$ (circle W.); $a'' = +0^s.221$ (circle E.); $c = 0^s.337$ (+ with circle E.).
Chronometer No. 1295 at $9^h\ 55^m$ *slow* $1^h\ 3^m\ 10^s.68 \pm 0^s.014$, *gaining* $0^s.025$ per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Mar. 26	κ Cancri	E.	9	7 57 51.74	+ 0.56	+ 0.04	+ 0.02	+ 0.40	− 0.05	52.71	9 1 3.43	+63 10.72	− 0.01
	1 Draconis	E.	9	8 16 13.98	1.52	0.08	− 2.54	2.76	0.04	15.76	9 19 26.48	[10.72]	.....
	10 Leonis Minoris	E.	9	8 23 27.93	0.64	0.02	− 0.18	0.48	0.04	28.85	9 26 39.82	10.97	− 0.26
	o Leonis	E.	9	8 31 22.03	0.56	0.01	+ 0.03	0.40	0.04	22.99	9 34 33.61	10.62	+ 0.09
	ε Leonis	E.	9	8 35 39.10	0.59	+ 0.01	− 0.07	0.43	0.04	40.02	9 38 50.66	10.64	0.07
	μ Leonis	E.	9	8 42 33.09	0.60	0.00	0.09	0.44	0.03	34.01	9 45 44.62	10.61	+ 0.10
	19 Leonis Minoris	E.	9	8 46 56.04	+ 0.66	0.00	0.24	+ 0.52	0.03	56.95	9 50 7.69	10.74	− 0.03
	41 Leonis Minoris	W.	9	9 33 32.96	− 0.59	− 0.02	0.05	− 0.47	0.01	31.82	10 36 42.55	10.73	− 0.09
	42 Leonis Minoris	W.	9	9 35 51.07	0.61	0.02	0.09	0.50	0.01	49.84	10 39 0.47	10.63	+ 0.08
	46 Leonis Minoris	W.	9	9 43 15.78	0.62	0.02	− 0.11	0.52	− 0.01	14.50	10 46 24.90	10.40	0.31
	β Leonis	W.	9	10 39 36.58	0.57	0.06	0.00	0.45	+ 0.02	35.52	11 42 46.21	10.69	+ 0.02
	β Virginis	W.	9	10 41 6.30	0.54	0.06	+ 0.06	0.43	0.02	5.35	11 44 16.12	10.77	− 0.06
	γ Ursæ Majoris	W.	9	10 44 13.08	0.73	0.09	− 0.29	0.73	0.02	11.96	11 47 21.87	10.61	+ 0.10
	δ Virginis	W.	9	10 55 45.86	0.56	0.08	+ 0.02	0.43	0.02	44.83	11 58 55.66	10.83	− 0.12
	4 Draconis	W.	9	11 3 26.12	− 1.21	− 0.20	− 1.17	− 2.12	+ 0.03	21.45	12 6 32.15	[+63 10.70]	.....

$a' = +0^s.390$ (circle E.); $a'' = +0^s.265$ (circle W.); $c = 0^s.410$ (+ with circle E.).
Chronometer No. 1295 at $9^h\ 59^m$ *slow* $1^h\ 3^m\ 10^s.71 \pm 0^s.021$, *losing* $0^s.025$ per hour.

Transits of stars observed at Port Spain, Trinidad, British West Indies, by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Mar. 25	30 Monocerotis	W.	11	7 19 58.37	— 0.52	— 0.03	+ 0.08	— 0.28	+ 0.11	57.73	8 19 29.07	+59 31.34	+ 0.05
	η Cancri	W.	11	7 26 3.21	0.57	— 0.03	— 0.06	0.30	0.11	2.36	8 25 33.78	31.42	— 0.03
	σ^2 Cancri	W.	11	7 47 12.03	0.59	+ 0.01	0.13	0.33	0.09	11.08	8 46 42.42	31.34	+ 0.05
	ι Ursæ Majoris	W.	10	7 51 15.00	0.64	0.00	0.29	0.42	0.09	13.74	8 50 45.16	31.42	— 0.03
	κ Ursæ Majoris	W.	11	7 55 41.32	0.64	— 0.02	0.28	0.42	0.09	40.05	8 55 11.57	31.52	— 0.13
	σ^3 Ursæ Majoris, U. C.	W.	8	8 0 2.41	0.77	0.06	— 0.68	0.74	0.08	0.24	8 59 31.82	[31.58]	.....
	θ Hydræ	W.	11	8 8 25.65	0.54	0.02	+ 0.04	0.28	0.08	24.93	9 7 56.30	31.37	+ 0.02
	83 Cancri	W.	11	8 12 34.89	0.56	0.02	— 0.04	0.30	0.08	34.05	9 12 5.37	31.32	+ 0.07
	1 Draconis, U. C	W.	3	8 19 60.54	— 1.23	— 0.04	— 2.06	— 1.99	+ 0.07	55.29	9 19 26.57	+59 [31.28]	.....
	1 Draconis, U. C	E.	5	8 19 53.09	+ 1.23	+ 0.16	— 0.93	+ 1.71	+ 0.07	55.33	9 19 26.57	+59 [31.24]	.....
	δ Crateris	E.	11	10 13 38.03	0.50	0.09	+ 0.06	0.25	— 0.01	38.92	11 13 10.32	31.40	— 0.01
	ι Leonis	E.	11	10 17 57.39	0.55	0.12	0.00	0.25	0.01	58.30	11 17 29.65	31.35	+ 0.04
	τ Leonis	E.	11	10 22 3.33	0.54	0.12	+ 0.02	0.24	0.02	4.23	11 21 35.61	31.38	+ 0.01
	γ Draconis, U. C	E.	11	10 24 34.59	0.80	0.19	— 0.35	0.71	0.02	35.92	11 24 7.50	[31.58]	.....
	ν Leonis	E.	11	10 31 5.69	0.53	0.14	+ 0.03	0.24	0.02	6.61	11 30 37.95	31.34	+ 0.05
	χ Ursæ Majoris	E.	11	10 40 0.66	0.64	0.17	— 0.13	0.36	0.03	1.67	11 39 33.10	31.43	— 0.04
	β Leonis	E.	9	10 43 14.00	0.56	0.10	0.01	0.25	0.03	14.87	11 42 46.21	31.34	+ 0.05
	γ Ursæ Majoris	E.	11	10 47 49.42	0.67	0.12	— 0.17	0.42	0.04	50.42	11 47 21.86	31.44	— 0.05
	o Virginis	E.	11	10 59 23.37	0.55	0.10	0.00	0.24	0.04	24.22	11 58 55.65	31.43	— 0.04
	4 Draconis, U. C	E.	9	11 6 58.95	+ 1.01	+ 0.21	— 0.63	+ 1.20	— 0.05	60.69	12 6 32.13	+59 [31.44]	.....

$a_1 = + 0^s.308$ (circle W.); $a_2 = + 0^s.139$ (circle E.); $c = + 0^s.262$ (circle E.).
Chronometer No. 1254 at $7^h\ 58^m$ *slow* $59^m\ 31^s.39 \pm 0^s.009$; *gaining* $0^s.043$ per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Mar. 26	1 Draconis, U. C	W.	5	8 19 57.81	— 1.23	+ 0.11	— 1.39	+ 0.54	+ 0.09	55.93	9 19 26.47	+59 [30.54]	.....
	α Hydræ	W.	11	8 22 1.01	0.52	0.06	+ 0.07	0.08	0.09	0.79	9 21 31.13	30.34	+ 0.11
	o Leonis	W.	11	8 35 3.64	0.55	+ 0.03	0.00	0.08	0.08	3.28	9 34 33.63	30.35	+ 0.10
	ϵ Leonis	W.	11	8 39 20.68	0.57	0.00	— 0.05	0.08	0.07	20.21	9 38 50.66	30.45	0.00
	μ Leonis	W.	11	8 46 14.55	0.58	+ 0.01	— 0.06	0.08	0.06	14.06	9 45 44.62	30.56	— 0.11
	π Leonis	W.	11	8 54 11.32	0.55	— 0.01	+ 0.01	0.08	0.06	10.91	9 53 41.41	30.50	— 0.05
	Regulus	W.	11	9 2 17.95	0.55	0.03	— 0.01	0.08	0.05	17.49	10 1 47.93	30.44	+ 0.01
	32 Ursæ Majoris, U. C.	W.	10	9 9 35.85	0.75	0.01	0.41	0.18	0.05	34.91	10 9 5.27	[30.36]	.....
	γ^1 Leonis	W.	11	9 13 40.16	0.57	0.02	0.04	0.08	0.04	39.65	10 13 10.13	30.48	— 0.03
	9 Draconis, U. C	W.	8	9 25 9.49	— 0.94	— 0.05	— 0.80	+ 0.32	+ 0.03	8.05	10 24 38.46	+59 [30.41]	.....
	9 Draconis, U. C	E.	5	9 25 7.44	+ 0.94	— 0.03	+ 0.06	— 0.49	+ 0.03	37.95	10 24 38.46	+59 [30.51]	.....
	δ Crateris	E.	11	10 13 39.31	0.50	+ 0.07	— 0.01	0.12	— 0.01	39.74	11 13 10.31	30.57	— 0.12
	ι Leonis	E.	11	10 17 58.73	0.55	0.08	0.00	0.12	0.01	59.23	11 17 29.65	30.42	+ 0.03
	τ Leonis	E.	11	10 22 4.61	0.54	0.08	0.00	0.12	0.02	5.09	11 21 35.61	30.52	+ 0.07
	λ Draconis, U. C	E.	9	10 24 36.41	0.80	0.12	+ 0.04	0.34	0.02	37.01	11 24 7.49	[30.48]	.....
	ν Leonis	E.	11	10 31 7.05	0.53	0.06	0.00	0.12	0.03	7.49	11 30 37.95	30.46	— 0.01
	χ Ursæ Majoris	E.	10	10 40 2.25	0.64	0.02	+ 0.01	0.17	0.03	2.72	11 39 33.10	30.38	+ 0.07
	β Leonis	E.	11	10 43 15.42	0.56	+ 0.02	0.00	0.12	0.04	15.84	11 42 46.21	30.37	+ 0.08
	γ Ursæ Majoris	E.	11	10 47 50.91	0.67	— 0.04	+ 0.02	0.20	0.04	51.32	11 47 21.86	30.54	— 0.09
	o Virginis	E.	11	10 59 24.97	+ 0.55	— 0.03	0.00	— 0.12	— 0.05	25.32	11 58 55.65	+ 59 30.33	+ 0.12

$a_1 = + 0^s.208$ (circle W.); $a_2 = - 0^s.015$ (circle E.); $c = - 0^s.096$ (circle E.).
Chronometer No. 1254 at $10^h\ 1^m$ *slow* $59^m\ 30^s.45 \pm 0^s.014$; *gaining* $0^s.053$ per hour.

Transits of stars observed at St. Pierre, Martinique, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Mar. 29	1 Draconis	E.	9	8 16 17.13	+ 1.52	— 0.06	— 4.82	+ 2.10	+ 0.03	15.90	9 19 26.18	[+63 10.28]	.....
	10 Leonis Minoris	E.	9	8 23 28.73	0.64	0.02	— 0.35	0.37	0.03	29.40	9 26 39.79	10.39	— 0.11
	o Leonis	E.	9	8 31 22.43	0.56	0.02	+ 0.06	0.30	0.03	23.36	9 34 33.62	10.26	+ 0.02
	ε Leonis	E.	9	8 35 39.68	0.59	0.02	— 0.13	0.33	0.02	40.47	9 38 50.63	10.16	0.12
	μ Leonis	E.	9	8 42 33.59	0.60	0.02	0.17	0.34	0.02	34.36	9 45 44.59	10.23	+ 0.05
	η Leonis	E.	9	8 57 25.09	0.57	0.05	— 0.04	0.31	0.02	25.90	10 0 36.18	10.28	0.00
	α Leonis	E.	8	8 58 36.68	0.56	0.05	+ 0.03	0.30	0.02	37.54	10 1 47.91	10.37	— 0.09
	32 Ursæ Majoris	E.	5	9 5 54.83	+ 0.96	0.09	— 1.40	+ 0.72	0.02	55.04	10 9 5.21	[10.17]	.....
	31 Leonis Minoris	W.	9	9 17 36 89	— 0.63	0.08	1.05	— 0.42	0.02	34.73	10 20 45.09	10.36	— 0.08
	9 Draconis	W.	8	9 21 38.76	1.11	0.12	8.15	1.43	0.01	27.96	10 24 38.34	[10.38]	.....
	46 Leonis Minoris	W.	9	9 43 16.77	0.62	0.06	0.92	0.40	0.01	14.78	10 46 24.89	10.11	+ 0.17
	α Ursæ Majoris	W.	9	9 53 2.92	0.80	0.07	— 3.41	0.72	0.01	57.93	10 56 8.11	10.18	+ 0.10
	χ Leonis	W.	9	9 55 29.48	— 0.55	— 0.05	+ 0.26	— 0.34	+ 0.01	28.81	10 58 39.19	+63 10.38	— 0.1

$a' = +0^s.740$ (circle E.); $a'' = +2^s.185$ (circle W.); $c = 0^s.317$ (+ with circle E.).

Chronometer No. 1295 at $10^h\ 28^m$ *slow* $1^h\ 3^m\ 10^s.28 \pm 0^s.023$, *gaining* $0^s.013$ per hour.

Transits of stars observed at Port Spain, Trinidad, British West Indies, by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Mar. 29	σ^2 Cancri	W.	11	7 47 15.16	— 0.59	+ 0.01	+ 0.07	+ 0.13	+ 0.12	14.90	8 46 42.36	+59 27.46	+ 0.01
	σ^2 Ursæ Majoris, U.C.	W.	11	8 0 3.91	0.77	0.01	+ 0.40	0.30	0.12	3.97	8 59 31.68	[27.71]	.....
	κ Cancri	W.	6	8 1 36.27	0.55	0.02	0.00	0.12	0.11	35.97	9 1 3.39	27.42	+ 0.05
	θ Hydræ	W.	11	8 8 29.17	0.54	0.02	— 0.02	0.12	0.11	28.86	9 7 56.26	27.40	+ 0.07
	1 Draconis, U. C.	W.	4	8 19 57.91	1.23	0.05	+ 1.22	0.81	0.10	58.86	9 19 26.18	[27.32]	.....
	o Leonis	W.	11	8 35 6.42	0.55	0.02	0.00	0.12	0.09	6.10	9 34 33.60	27.50	— 0.03
	ε Leonis	W.	11	8 39 23.41	0.57	0.02	+ 0.05	0.13	0.08	23.12	9 38 50.63	27.51	0.04
	μ Leonis	W.	11	8 46 17.40	0.58	0.02	0.06	0.13	0.08	17.11	9 45 44.59	27.48	0.01
	Regulus	W.	10	9 2 20.70	0.55	0.02	0.01	0.12	0.07	20.37	10 1 47.91	27.54	— 0.07
	32 Ursæ Majoris, U.C.	W.	8	9 9 37.51	— 0.75	+ 0.03	+ 0.36	+ 0.28	+ 0.06	37.49	10 9 5.21	+59 [27.72]	.....
	32 Ursæ Majoris, U.C.	E.	3	9 9 35.82	+ 0.75	+ 0.06	+ 1.05	— 0.38	+ 0.06	37.36	10 9 5.21	+59 [27.85]	.....
	o Virginis	E.	6	10 59 27.64	0.55	0.18	— 0.01	0.16	— 0.02	28.19	11 58 55.67	27.48	— 0.01
	η Virginis	E.	11	11 14 7.99	0.53	0.15	0.10	0.16	0.03	8.38	12 13 35.74	27.36	+ 0.11
	β Corvi	E.	11	11 28 26.79	0.49	0.12	— 0.31	0.17	0.04	26.88	12 27 54.40	27.52	— 0.05
	κ Draconis, U.C.	E.	5	11 28 47.63	0.81	0.21	+ 1.36	0.46	0.05	49.50	12 28 17.08	[27.58]	.....
	γ^1 Virginis	E.	11	11 35 56.77	0.53	0.13	— 0.10	0.16	0.05	57.12	12 35 24.64	27.52	— 0.05
	32 Camelopard., U.C.	E.	8	11 49 0.12	1.49	0.36	+ 4.89	1.50	0.06	5.30	12 48 32.97	[27.67]	.....
	ε Virginis	E.	11	11 56 34.44	0.55	0.13	+ 0.01	0.16	0.07	34.90	12 56 2.34	27.44	+ 0.03
	θ Virginis	E.	11	12 4 6.08	+ 0.52	+ 0.13	— 0.14	— 0.16	0.07	6.36	13 3 33.81	27.45	+ 0.02
	Polaris, L. C.	E.	5	12 12 60.03	— 3.70	— 0.96	—22.05	+ 6.58	— 0.08	39.82	1 12 7.37	+59 [27.55]	.....

$a_1 = -0^s.182$ (circle W.); $a_2 = -0^s.526$ (circle E.); $c = -0^s.135$ (circle E.).
Chronometer No. 1254 at $10^h\ 30^m$ *slow* $59^m\ 27^s.47 \pm 0^s.010$, *gaining* $0^s.046$ per hour.

Transits of stars observed at St. Thomas, West Indies, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
April 29	*l* Leonis	W.	9	9 54 43.83	— 0.56	— 0.07	+ 0.09	— 0.28	— 0.01	43.00	10 42 46.07	+48 3.07	0.07
	B. A. C. 1508	W.	9	10 2 9.38	1.36	+ 0.07	— 3.14	1.36	0.01	3.58	10 50 6.47	[2.89]	.....
	χ Leonis	W.	7	10 10 36.71	0.55	— 0.02	+ 0.13	0.27	0.01	35.99	10 58 38.98	2.99	+ 0.01
	δ Leonis	W.	9	10 19 30.66	0.59	— 0.02	— 0.04	0.29	— 0.01	29.71	11 7 32.77	3.06	— 0.06
	δ Crateris	W.	9	10 25 7.42	0.48	+ 0.04	+ 0.40	0.28	0.00	7.10	11 13 10.14	3.04	— 0.04
	σ Leonis	W.	7	10 26 44.07	0.54	+ 0.03	0.15	0.27	0.00	43.44	11 14 46.36	2.92	+ 0.08
	τ Leonis	W.	9	10 33 33.05	0.51	— 0.02	+ 0.27	0.27	0.00	32.52	11 21 35.47	2.95	+ 0.05
	λ Draconis	W.	9	10 36 6.73	1.00	0.11	— 1.67	0.80	0.00	3.15	11 24 6.58	[3.43]	.....
	Groombridge 2029	W.	4	12 46 19.67	— 1.01	0.17	1.88	— 0.87	0.00	15.74	13 34 18.44	[2.70]	.....
	Groombridge 2029	E.	5	12 46 16.47	+ 1.01	0.19	2.49	+ 0.75	0.00	15.55	13 34 18.44	[2.89]	.....
	η Ursæ Majoris	E.	9	12 54 39.35	0.73	— 0.13	0.78	0.36	0.00	39.53	13 42 42.57	3.04	— 0.04
	η Bootis	E.	9	13 0 45.22	0.58	+ 0.15	0.01	0.25	0.00	46.19	13 48 49.28	3.09	— 0.09
	α Draconis	E.	9	13 13 3.73	0.67	+ 0.26	1.66	0.54	0.00	3.54	14 1 6.65	[3.11]	.....
	α Bootis	E.	8	13 21 59.09	0.58	— 0.02	0.03	0.25	0.00	59.87	14 10 2.79	2.92	+ 0.08
	θ Bootis	E.	9	13 32 59.01	0.75	0.14	0.89	0.38	0.00	59.11	14 21 1.97	2.86	+ 0.14
	ρ Bootis	E.	9	13 38 28.22	+ 0.63	— 0.18	— 0.24	+ 0.27	0.00	28.70	14 26 31.79	+48 3.09	— 0.09

$a' = +0^s.727$ (circle W.); $a'' = +0^s.966$ (circle E.); $c = 0^s.252$ (+ with circle E.).
Chronometer No. 1295 at $12^h\ 0^m$ *slow* $48^m\ 3^s.00 \pm 0^s.015$, *losing* $0^s.003$ per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
May 2	τ Leonis	E.	9	10 33 31.53	+ 0.51	+ 0.04	+ 0.37	+ 0.24	— 0.02	32.67	11 21 35.45	+48 2.78	0.00
	λ Draconis	E.	9	10 36 4.14	1.00	0.07	— 2.22	0.70	0.02	3.61	11 24 6.46	[2.85]	.....
	υ Leonis	E.	9	10 42 33.95	0.52	0.06	0.32	0.24	0.02	35.07	11 30 37.82	2.75	+ 0.03
	3 Draconis	E.	9	10 47 34.32	0.94	0.08	— 1.95	0.62	0.02	33.99	11 35 37.16	[3.17]	.....
	β Leonis	E.	9	10 54 42.39	0.57	0.02	+ 0.06	0.25	0.01	43.28	11 42 46.09	2.81	— 0.03
	β Virginis	E.	9	10 56 12.16	0.53	0.02	+ 0.27	0.24	0.01	13.23	11 44 16.03	2.80	0.02
	γ Ursæ Majoris	E.	8	10 59 18.25	0.76	0.04	— 1.00	0.41	0.01	18.45	11 47 21.49	3.04	— 0.26
	ο Virginis	E.	9	11 10 51.82	0.55	0.06	+ 0.16	0.24	0.01	52.82	11 58 55.60	2.78	0.00
	8 Draconis	E.	6	12 2 34.41	+ 0.91	0.26	— 1.21	+ 0.59	— 0.01	34.35	12 50 36.98	[2.63]	.....
	Groombridge 2001	W.	9	12 35 6.41	— 1.09	0.06	2.40	— 0.95	+ 0.04	2.07	13 23 4.60	[2.53]	.....
	17 Canum Venat	W.	9	12 41 16.80	0.65	0.02	0.36	0.36	0.04	15.49	13 29 18.29	2.80	— 0.02
	Groombridge 2029	W.	9	12 46 19.37	1.01	0.04	— 2.21	0.89	0.04	15.34	13 34 18.40	[3.06]	.....
	τ Bootis	W.	9	12 53 22.35	0.58	0.02	0.00	0.29	0.05	21.55	13 41 24.37	2.82	— 0.04
	η Bootis	W.	9	13 0 47.06	— 0.58	+ 0.02	— 0.01	— 0.29	+ 0.05	46.25	13 48 48.99	+48 2.74	+ 0.04

$a' = +0^s.990$ (circle E.); $a'' = +0^s.857$ (circle W.); $c = 0^s.258$ (+ with circle E.).
Chronometer No. 1295 at $11^h\ 23^m$ *slow* $48^m\ 2^s.78 \pm 0^s.007$, *losing* $0^s.031$ per hour.

Transits of stars observed at St. Croix, (Christianstadt), by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
Apr. 29	l Leonis	E.	11	9 56 34.07	− 0.14	+ 0.55	− 0.46	− 0.25	+0.07	33.84	10 42 46.07	+46 12.23	+ 0.03
	Groom. 1706, U. C.	E.	11	10 3 37.02	0.32	1.32	+ 17.38	1.23	0.07	54.24	10 50 6.47	[12.23]	.....
	α Ursæ Majoris	E.	11	10 9 46.75	0.20	0.83	+ 6.08	0.53	0.06	54.99	10 56 7.40	12.41	− 0.15
	χ Leonis	E.	10	10 12 27.30	0.13	0.54	− 0.68	0.25	0.06	26.84	10 58 38.97	12.13	+ 0.13
	δ Leonis	E.	11	10 21 20.06	0.14	0.58	+ 0.26	0.26	0.06	20.56	11 7 32.77	12.21	+ 0.05
	δ Crateris	E.	11	10 26 59.86	0.11	0.47	− 2.18	0.25	0.05	57.84	11 13 10.14	12.30	− 0.04
	ι Leonis	E.	11	10 31 17.52	0.13	0.55	0.46	0.25	0.05	17.28	11 17 29.50	12.22	+ 0.04
	τ Leonis	E.	11	10 35 23.98	0.14	0.52	− 0.98	0.25	0.05	23.18	11 21 35.47	12.29	− 0.03
	λ Draconis, U. C	E.	6	10 37 45.02	− 0.27	+ 0.97	+ 9.25	− 0.72	+0.05	54.30	11 24 6.58	+46 [12.28]	.....
	λ Draconis, U. C	W.	3	10 37 45.39	− 0.13	− 0.97	+ 9.09	+ 0.60	+0.05	54.03	11 24 6.58	+46 [12.55]	.....
	Polaris, L. C	W.	3	12 26 161.34	+ 1.56	+ 6.46	−159.99	− 8.74	−0.02	0.61	1 12 12.89	[12.28]	.....
	ξ Virginis	W.	11	12 42 14.10	− 0.11	− 0.51	− 1.19	+ 0.21	0.02	12.51	13 28 24.76	12.25	+ 0.01
	τ Bootis	W.	11	12 55 12.76	0.12	0.57	+ 0.02	0.22	0.03	12.28	13 41 24.62	12.34	− 0.08
	η Ursæ Majoris	W.	8	12 56 27.60	0.14	0.71	3.25	0.32	0.03	30.29	13 42 42.57	12.28	0.02
	η Bootis	W.	11	13 2 37.37	0.11	0.57	+ 0.09	0.22	0.03	36.97	13 48 49.28	12.31	− 0.05
	β Centauri	W.	11	13 8 63.55	0.04	0.23	− 7.63	0.41	0.04	56.02	13 55 8.17	12.15	+ 0.11
	α Draconis, U. C	W.	11	13 14 48.25	0.13	0.87	+ 6.81	0.48	0.04	54.50	14 1 6.69	[12.19]	.....
	α Bootis	W.	11	13 23 50.90	0.08	0.57	0.15	0.22	0.04	50.58	14 10 2.79	12.21	+ 0.05
	θ Bootis	W.	11	13 34 46.65	0.15	0.73	3.67	0.34	0.05	49.73	14 21 1.97	12.24	+ 0.02
	5 Ursæ Minoris, U. C	W.	8	13 41 30.40	− 0.26	− 1.19	+ 14.10	+ 0.87	−0.05	43.87	14 27 56.06	+46 [12.19]	.....

$a_1 = -3^s.998$ (circle E.); $a_2 = -3^s.934$ (circle W.); $c = -0^s.296$ (circle E. at upper culmination).
Chronometer No. 1254 at $12^h\ 3^m$ *slow* $46^m\ 12^s.26 \pm 0^s.012$, *gaining* $0^s.033$ per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
May 2	l Leonis	W.	11	9 56 37.03	+ 0.18	− 0.55	0.00	− 0.06	+0.09	36.69	10 42 46.04	+46 9.35	− 0.10
	Groom. 1706, U. C	W.	10	10 3 56.93	0.53	1.32	+ 0.11	0.27	0.08	56.06	10 50 6.22	[10.16]	.....
	δ Leonis	W.	10	10 29 23.78	0.19	0.58	0.00	0.06	0.06	23.39	11 7 32.74	9.35	− 0.10
	δ Crateris	W.	11	10 27 1.37	0.16	0.47	− 0.01	0.06	0.06	1.05	11 13 10.11	9.06	+ 0.19
	ι Leonis	W.	11	10 31 20.58	0.18	0.55	0.00	0.06	0.05	20.20	11 17 29.47	9.27	− 0.02
	τ Leonis	W.	11	10 35 26.57	0.17	0.52	− 0.01	0.06	0.05	26.20	11 21 35.45	9.25	0.00
	λ Draconis, U. C	W.	6	10 37 57.85	+ 0.32	− 0.97	+ 0.06	− 0.16	+0.05	57.15	11 24 6.45	+46 [9.30]	.....
	λ Draconis, U. C	E.	5	10 37 55.38	+ 0.22	+ 0.97	+ 0.59	+ 0.04	+0.04	57.24	11 24 6.45	+46 [9.21]	.....
	υ Leonis	E.	11	10 44 27.97	0.12	0.51	− 0.08	0.02	+0.04	28.58	11 30 37.82	9.24	+ 0.01
	κ Draconis, U. C	E.	6	11 42 5.24	0.34	0.98	+ 0.61	0.04	−0.02	7.19	12 28 16.52	[9.33]	.....
	γ Virginis	E.	11	11 49 14.78	0.16	0.51	− 0.08	0.02	0.02	15.37	12 35 24.70	9.33	− 0.08
	ϵ Virginis	E.	11	12 9 52.71	0.18	0.55	0.03	0.02	0.04	53.39	12 56 2.48	9.09	+ 0.16
	θ Virginis	E.	11	12 17 24.20	+ 0.16	+ 0.50	0.10	+ 0.02	0.05	24.73	13 3 33.97	9.24	+ 0.01
	Polaris, L. C	E.	4	12 26 24.78	− 2.63	− 6.46	10.33	− 0.64	0.06	4.66	1 12 13.94	[9.28]	.....
	Spica	E.	11	12 32 32.09	+ 0.16	+ 0.48	0.12	+ 0.02	0.07	32.56	13 18 41.88	9.32	− 0.07
	ξ Virginis	E.	11	12 42 14.95	+ 0.17	+ 0.51	+ 0.06	+ 0.02	−0.08	15.49	13 28 24.77	+46 9.28	− 0.03

$a_1 = -0^s.25$ (circle W.); $a_2 = -0^s.254$ (circle E.); $c = +0^s.035$ (circle E. at upper culmination).
Chronometer No. 1254 at $11^h\ 25^m$ *slow* $46^m\ 9^s.25 \pm 0^s.020$, *gaining* $0^s.060$ per hour.

Transits of stars observed at St. Thomas, West Indies, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	r.
1876.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
May 3	37 Ursæ Majoris.....	E.	6	9 39 9.57	+ 0.79	— 0.13	— 0.97	+ 0.30	0.00	9.56	10 27 12.73	[+48 3.17]	.....
	35 Ursæ Majoris.....	E.	9	9 46 11.46	0.99	0.11	1.84	0.47	0.00	10.97	10 34 14.40	[3.43]	.....
	42 Leonis Minoris	E.	9	9 50 56.43	0.63	— 0.03	— 0.21	0.20	0.00	57.02	10 39 0.08	3.06	— 0.07
	l Leonis.....	E.	9	9 54 42.17	0.56	0.00	+ 0.11	0.17	0.00	43.01	10 42 46.03	3.02	— 0.03
	β Ursæ Majoris.....	E.	9	10 6 20.97	0.79	+ 0.01	— 0.94	0.32	0.00	21.15	10 54 24.07	2.92	+ 0.07
	χ Leonis.....	E.	9	10 10 35.14	0.55	0.02	+ 0.15	0.17	0.00	36.03	10 58 38.93	2.90	0.09
	δ Leonis.....	E.	9	10 19 28.99	0.59	0.03	— 0.04	0.18	0.00	29.75	11 7 32.73	2.98	+ 0.01
	Groombridge 1771..	E.	6	10 27 29.71	+ 0.89	0.05	1.40	+ 0.39	0.00	29.64	11 15 32.10	[2.46]	.....
	Groombridge 1771..	W.	6	10 27 32.40	— 0.89	0.03	— 1.72	— 0.49	0.00	29.33	11 15 32.10	[2.77]	.....
	ν Leonis.....	W.	9	10 42 35.16	0.52	0.02	+ 0.32	0.20	0.00	34.78	11 30 37.81	3.03	— 0.04
	3 Draconis.....	W.	8	10 47 37.32	0.94	+ 0.03	— 1.97	0.53	0.00	33.91	11 35 37.13	[3.22]	.....
	β Leonis	W.	11	10 54 43.88	0.57	0.00	+ 0.06	0.21	0.00	43.16	11 42 46.08	2.92	+ 0.07
	ϵ Virginis.....	W.	9	11 10 53.26	0.55	— 0.03	— 0.16	0.21	0.00	52.63	11 58 55.60	2.97	+ 0.02
	η Virginis.....	W.	9	11 25 33.17	0.52	0.06	+ 0.31	0.20	0.00	32.70	12 13 35.71	3.01	— 0.02
	24 Comæ.....	W.	9	11 40 54.77	0.58	0.09	— 0.01	0.22	0.00	53.87	12 28 56.93	3.06	— 0.07
	γ Virginis.....	W.	9	11 47 22.20	— 0.52	— 0.09	+ 0.33	— 0.20	0.00	21.72	12 35 24.70	+48 2.98	+ 0.01

$a' = + 0^s.816$ (circle E.); $a'' = + 1^s.002$ (circle W.); $c = 0^s.184$ (+ with circle E.).
Chronometer No. 1295 at $12^h\ 3^m$ *slow* $48^m\ 2^s.99 \pm 0^s.011$, *gaining* $0^s.002$ per hour.

1876.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
May 4	9 Draconis.....	E.	9	9 36 33.92	+ 1.23	— 0.02	— 2.14	+ 0.17	— 0.01	33.15	10 24 36.11	[+48 2.96]	.....
	35 Ursæ Majoris.....	E.	9	9 46 11.56	0.99	0.04	1.34	0.11	0.01	11.27	10 34 14.35	[3.08]	.....
	42 Leonis Majoris	E.	9	9 50 56.66	0.63	0.01	— 0.15	0.05	0.01	57.17	10 39 0.08	2.91	— 0.08
	l Leonis.....	E.	9	9 54 42.47	0.56	0.01	+ 0.08	0.04	0.01	43.13	10 42 46.01	2.88	— 0.05
	46 Leonis Minoris	E.	9	9 58 21.32	0.64	0.01	— 0.21	0.05	— 0.01	21.78	10 46 24.51	2.73	+ 0.10
	χ Leonis.....	E.	9	10 10 35.31	0.55	0.03	+ 0.11	0.04	0.00	35.98	10 58 38.92	2.94	— 0.11
	ψ Ursæ Majoris.....	E.	9	10 14 40.73	0.69	0.05	— 0.38	0.05	0.00	41.04	11 2 43.72	2.68	+ 0.15
	δ Leonis.....	E.	9	10 19 29.34	0.59	0.05	0.03	0.04	0.00	29.89	11 7 32.72	2.83	0.00
	Groombridge 1771..	E.	5	10 27 29.73	+ 0.89	0.09	1.02	+ 0.09	0.00	29.60	11 15 32.05	[2.45]	.....
	Groombridge 1771..	W.	5	10 27 31.71	— 0.89	0.08	— 1.58	— 0.19	0.00	28.97	11 15 32.05	[3.08]	.....
	τ Leonis.....	W.	9	10 33 33.02	0.51	0.05	+ 0.34	0.08	0.00	32.72	11 21 35.43	2.71	+ 0.12
	ν Leonis.....	W.	9	10 42 35.34	0.52	0.05	+ 0.29	0.08	0.00	34.98	11 30 37.81	2.83	0.00
	χ Ursæ Majoris.....	W.	8	10 51 31.48	0.72	0.06	— 0.70	0.12	0.00	29.88	11 39 32.76	2.88	— 0.05
	β Leonis.....	W.	9	10 54 43.88	0.57	0.05	+ 0.06	0.08	0.00	43.94	11 42 46.07	2.83	0.00
	γ Virginis.....	W.	9	11 47 22.21	0.52	0.07	+ 0.30	0.08	0.00	21.84	12 35 24.70	2.86	— 0.03
	ϵ Ursæ Majoris.....	W.	8	12 0 37.04	0.78	0.11	— 1.04	0.15	0.00	34.96	12 48 37.90	2.94	0.11
	43 Comæ	W.	9	12 18 5.83	0.62	0.10	0.18	0.09	+ 0.01	4.85	13 6 7.70	2.85	— 0.02
	Groombridge 2001..	W.	5	12 35 6.24	— 1.09	— 0.18	— 2.58	— 0.27	+ 0.01	2.13	13 23 4.55	[+48 2.42]	.....

$a' = + 0^s.594$ (circle E.); $a'' = + 0^s.920$ (circle W.); $c = 0^s.059$ (+ with circle E.).
Chronometer No. 1295 at $11^h\ 9^m$ *slow* 48 $2^s.83 \pm 0^s.015$, *losing* $0^s.005$ per hour.

Transits of stars observed at St. Croix (Christianstadt), by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
May 3	*l* Leonis	W.	11	9 56 37.85	— 0.55	0.00	— 0.03	+ 0.33	+ 0.11	37.71	10 42 46.03	+46 8.32	— 0.02
	Groom. 1706, U. C	W.	10	10 3 56.38	1.32	+ 0.02	+ 1.10	1.62	0.10	57.90	10 50 6.13	[8.23]	.....
	α Ursæ Majoris	W.	11	10 9 58.77	0.83	0.03	+ 0.38	0.70	0.10	59.15	10 56 7.28	8.13	+ 0.17
	χ Leonis	W.	11	10 12 30.79	0.54	0.03	— 0.04	0.33	0.09	30.66	10 58 38.93	8.27	+ 0.03
	δ Leonis	W.	11	10 21 24.48	0.58	0.03	+ 0.02	0.35	0.09	24.39	11 7 32.73	8.34	— 0.04
	δ Crateris	W.	11	10 27 2.06	0.47	+ 0.03	— 0.14	0.33	0.08	1.89	11 13 10.10	8.21	+ 0.09
	ι Leonis	W.	11	10 31 21.31	0.55	0.00	0.03	0.33	0.08	21.14	11 17 29.46	8.32	— 0.02
	τ Leonis	W.	11	10 35 27.25	0.52	0.00	— 0.06	0.32	0.08	27.07	11 21 35.44	8.37	— 0.07
	λ Draconis, U. C	W.	5	10 37 57.28	— 0.97	— 0.02	+ 0.58	+ 0.95	+ 0.07	57.89	11 24 6.41	+46 [8.52]	.....
	λ Draconis, U. C	E.	6	10 37 57.49	+ 0.97	— 0.02	+ 0.76	— 1.07	+ 0.07	58.20	11 24 6.41	+46 [8.21]	.....
	ν Leonis	E.	11	10 44 29.37	+ 0.51	0.00	— 0.10	— 0.36	+ 0.07	29.49	11 30 37.81	8.32	— 0.02
	Polaris, L. C	E.	4	12 26 11.15	— 6.46	— 0.72	13.38	+15.39	— 0.02	5.96	1 12 14.32	[8.36]	.....
	Spica	E.	9	12 32 33.61	+ 0.48	+ 0.01	0.16	— 0.37	0.02	33.56	13 18 41.89	8.33	— 0.03
	η Virginis	E.	11	12 42 16.40	0.51	+ 0.01	— 0.10	0.36	0.03	16.43	13 28 24.77	8.34	— 0.04
	τ Bootis	E.	11	12 55 16.17	0.57	0.00	+ 0.02	0.38	0.04	16.34	13 41 24.63	8.29	+ 0.01
	η Ursæ Majoris	E.	11	12 56 33.88	0.71	0.00	0.27	0.56	0.04	34.26	13 42 42.55	8.29	0.01
	η Bootis	E.	11	13 2 40.79	0.57	0.00	0.08	0.38	0.05	41.01	13 48 49.29	8.28	+ 0.02
	α Draconis, U. C	E.	11	13 14 57.84	0.87	— 0.05	0.57	6.86	0.06	58.31	14 1 6.66	[8.35]	.....
	Arcturus	E.	11	13 23 54.33	+ 0.57	0.00	+ 0.01	— 0.38	— 0.06	54.57	14 10 2.81	+46 8.24	+ 0.06

$a_1 = -0^s.252$ (circle W.); $a_2 = -0^s.329$ (circle E.); $c = -0^s.344$ (circle E. at upper culmination).
Chronometer No. 1254 at $12^h\ 6^m$ *slow* $46^m\ 8^s.30 \pm 0^s.008$, *gaining* $0^s.050$ per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
May 4	*l* Leonis	W.	11	9 56 39.19	— 0.55	0.00	— 0.03	+ 0.01	+ 0.04	38.66	10 42 46.02	+46 7.36	0.00
	Groom. 1706, U. C	W.	11	10 3 58.97	1.32	+ 0.05	+ 0.98	0.03	0.04	58.75	10 50 6.05	[7.30]	.....
	α Ursæ Majoris	W.	11	10 9 60.25	0.83	+ 0.05	0.35	0.02	0.03	59.87	10 56 7.24	7.37	— 0.01
	δ Leonis	W.	11	10 21 25.87	0.58	0.00	+ 0.01	0.01	0.03	25.34	11 7 32.72	7.38	0.02
	δ Crateris	W.	10	10 27 3.30	0.47	— 0.02	— 0.12	0.01	0.02	2.72	11 13 10.10	7.38	0.02
	ι Leonis	W.	11	10 31 22.61	0.55	0.00	0.03	0.01	0.02	22.06	11 17 29.45	7.39	— 0.03
	τ Leonis	W.	11	10 35 28.62	0.52	0.00	— 0.05	0.01	0.02	28.08	11 21 35.43	7.35	+ 0.01
	λ Draconis, U. C	W.	6	10 37 59.32	— 0.97	0.00	+ 0.52	+ 0.02	+ 0.02	58.91	11 24 6.37	+46 [7.46]	.....
	λ Draconis, U. C	E.	6	10 37 57.11	+ 0.97	— 0.05	+ 0.80	— 0.14	+ 0.02	58.71	11 24 6.37	+46 [7.66]	.....
	ν Leonis	E.	11	10 44 29.94	0.51	— 0.01	— 0.11	0.05	+ 0.02	30.30	11 30 37.81	7.51	— 0.15
	η Virginis	E.	11	11 27 27.96	0.51	+ 0.04	0.11	0.05	— 0.01	28.34	12 13 35.71	7.37	— 0.01
	β Corvi	E.	11	11 41 46.97	0.45	0.03	— 0.25	0.05	0.02	47.13	12 27 54.43	7.30	+ 0.06
	κ Draconis, U. C	E.	6	11 42 7.54	0.98	0.07	+ 0.83	0.14	0.02	9.96	12 28 16.45	[7.19]	.....
	γ Virginis	E.	11	11 49 16.85	0.51	0.04	— 0.11	0.05	0.02	17.22	12 35 24.69	7.47	— 0.11
	32 Camelopard., U. C	E.	10	12 2 18.20	2.10	0.16	+ 3.07	0.45	0.03	23.05	12 48 30.81	[7.76]	.....
	ε Virginis	E.	11	12 9 54.76	0.55	0.04	— 0.04	0.05	0.03	55.23	12 56 2.47	7.24	+ 0.12
	θ Virginis	E.	11	12 17 26.34	+ 0.50	+ 0.04	0.14	— 0.05	0.04	26.65	13 3 33.97	7.32	+ 0.04
	Polaris, L. C	E.	5	12 26 26.63	— 6.46	— 0.72	14.07	+ 1.99	0.04	7.33	1 12 14.77	[7.44]	.....
	Spica	E.	4	12 32 34.39	+ 0.48	+ 0.03	— 0.17	— 0.05	0.04	34.64	13 18 41.89	7.25	+ 0.11
	τ Bootis	E.	11	12 55 16.85	+ 0.57	+ 0.02	0.00	— 0.05	— 0.06	17.33	13 41 24.63	+46 7.30	+ 0.06

$a_1 = -0^s.225$ (circle W.); $a_2 = -0^s.346$ (circle E.); $c = -0^s.027$ (circle E.).
Chronometer No. 1254 at $11^h\ 11^m$ *slow* $46\ 7^s.36 \pm 0^s.013$, *gaining* $0^s.074$ per hour.

Transits of stars observed at Christianstadt, St. Croix, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	n.
1876.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
May 9	λ Draconis	E.	9	10 35 11.07	+ 0.99	— 0.14	— 2.67	+ 0.68	+ 0.03	9.96	11 24 6.15	[+48 56.19]	.....
	Groombridge, 1852	E.	9	11 10 9.64	1.29	+ 0.11	— 4.65	1.08	+ 0.02	7.49	11 59 2.77	[55.28]	.....
	θ Virginis	E.	9	12 14 37.32	0.51	— 0.03	+ 0.45	0.23	— 0.01	38.47	13 3 33.96	55.49	0.00
	43 Comæ	E.	9	12 17 11.56	0.62	0.04	— 0.29	0.27	0.01	12.11	13 6 7.68	55.57	— 0.08
	α Virginis	E.	9	12 29 44.99	0.49	0.05	+ 0.55	0.24	0.02	46.20	13 18 41.89	55.69	— 0.20
	ζ Virginis	E.	8	12 39 28.26	0.53	0.06	+ 0.35	0.23	0.02	29.29	13 28 24.77	55.48	+ 0.01
	17 Canum Venat	E.	7	12 40 22.64	0.65	0.07	— 0.49	0.29	0.03	22.99	13 29 18.25	55.26	+ 0.23
	Groombridge 2029	E.	9	12 45 24.23	1.03	0.11	3.00	0.75	0.03	22.87	13 34 18.22	[55.35]	.....
	τ Bootis	E.	9	12 52 28.45	0.58	0.08	0.01	0.24	0.03	29.15	13 41 24.64	55.49	0.00
	10ι Draconis	E.	6	12 58 58.35	+ 0.89	0.15	2.05	+ 0.55	0.03	57.56	13 47 53.38	[55.82]	.....
	10ι Draconis	W.	6	12 59 2.01	— 0.89	0.39	— 2.28	— 0.65	0.03	57.77	13 47 53.38	[55.61]	.....
	τ Virginis	W.	9	13 6 27.67	0.53	0.20	+ 0.35	0.27	0.04	26.98	13 55 22.49	55.51	— 0.02
	α Draconis	W.	9	13 12 15.29	0.88	— 0.30	— 2.24	0.64	0.04	11.19	14 1 6.60	[55.41]	.....
	θ Bootis	W.	7	13 32 8.81	0.73	+ 0.03	— 1.19	0.44	0.05	6.43	14 21 1.98	55.55	— 0.06
	φ Virginis	W.	6	13 32 56.04	0.52	0.02	+ 0.42	0.27	0.05	55.64	14 21 51.27	55.63	— 0.14
	ρ Bootis	W.	9	13 37 37.70	0.63	0.06	— 0.33	0.31	0.05	36.44	14 26 31.84	55.40	+ 0.09
	π Bootis	W.	9	13 46 1.79	0.57	0.08	+ 0.02	0.28	0.06	0.98	14 34 56.38	55.40	+ 0.09
	μ Virginis	W.	9	13 47 38.72	0.51	+ 0.04	+ 0.50	0.27	0.06	38.42	14 36 33.96	55.54	— 0.05
	ε Bootis	W.	9	13 50 42.58	— 0.62	— 0.02	— 0.24	— 0.30	— 0.06	41.34	14 39 36.93	+48 55.59	— 0.10

$a' = +1^s.155$ (circle E.); $a'' = +1^s.284$ (circle W.); $c = 0^s.252$ (+ with circle E.).
Chronometer No. 1295 at $11^h\ 47^m$ *slow* $42^m\ 55^s.49 \pm 0^s.022$, *gaining* $0^s.029$ per hour.

1876.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
May 11	ν Leonis	E.	9	10 41 41.54	+ 0.53	+ 0.07	+ 0.34	+ 0.25	+ 0.05	42.78	11 30 37.75	+48 54.97	— 0.03
	3 Draconis	E.	9	10 46 42.63	0.92	0.12	— 2.18	0.65	0.05	42.19	11 35 36.83	[54.64]	.....
	χ Ursæ Majoris	E.	9	10 50 37.54	0.71	0.09	— 0.85	0.37	0.05	37.91	11 39 32.63	54.72	+ 0.22
	β Leonis	E.	9	10 53 50.11	0.57	0.08	+ 0.04	0.26	0.04	51.10	11 42 46.01	54.91	+ 0.03
	β Virginis	E.	7	10 55 19.83	0.53	0.08	+ 0.29	0.25	0.04	21.02	11 44 15.97	54.95	— 0.01
	γ Ursæ Majoris	E.	9	10 58 26.37	0.76	0.11	— 1.12	0.43	0.04	26.59	11 47 21.30	54.71	+ 0.23
	o Virginis	E.	9	11 9 59.43	0.55	0.08	+ 0.16	0.25	0.03	0.50	11 58 55.54	55.04	— 0.10
	4 Draconis	E.	6	11 17 36.93	+ 1.33	0.20	— 4.72	+ 1.22	0.03	34.99	12 6 30.11	[55.12]	.....
	4 Draconis	W.	10	11 17 42.72	— 1.33	0.15	5.57	— 1.42	0.03	34.58	12 6 30.11	[55.53]	.....
	6 Canum Venat	W.	8	11 30 53.64	0.66	0.07	0.64	0.38	0.02	52.05	12 19 46.93	54.88	+ 0.06
	20 Comæ	W.	8	11 34 37.74	0.59	0.06	0.09	0.31	0.01	36.82	12 23 31.82	55.00	— 0.06
	8 Canum Venat	W.	9	11 39 0.71	0.67	0.07	— 0.72	0.39	+ 0.01	59.01	12 27 53.81	54.80	+ 0.14
	ε Virginis	W.	7	12 7 8.21	0.56	0.06	+ 0.14	0.29	— 0.01	7.55	12 56 2.45	54.90	+ 0.04
	θ Virginis	W.	9	12 14 39 22	— 0.51	+ 0.06	0.51	— 0.29	0.01	38.98	13 3 33.96	54.98	— 0.04
	Polaris, S. P	W.	5	12 22 12.57	+ 6.58	— 0.72	52.66	+12.20	0.02	23.27	1 12 19.02	[55.75]	.....
	α Virginis	W.	9	12 29 47.04	— 0.49	+ 0.05	+ 0.62	— 0.29	— 0.03	46.90	13 18 41.89	+48 54.99	— 0.05

$a' = +1^s.097$ (circle E.); $a'' = +1^s.296$ (circle W.); $c = 0^s.268$ (+ with circle E.).
Chronometer No. 1295 at $11^h\ 54^m$ *slow* $48^m\ 54^s.94 \pm 0^s.015$, *gaining* $0^s.042$ per hour.

Transits of stars observed at St. Thomas (Charlotte Amalie), by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	n.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
May 9	δ Leonis	W.	11	10 22 24.69	— 0.58	+ 0.01	+ 0.37	+ 0.04	+ 0.03	24.56	11 7 32.67	+45 8.11	— 0.03
	δ Crateris	W.	11	10 28 6.13	0.47	0.00	— 3.75	0.04	0.03	1.98	11 13 10.05	8.07	+ 0.01
	τ Leonis	W.	11	10 36 29.53	0.52	0.00	— 1.73	0.04	0.02	27.34	11 21 35.39	8.05	+ 0.03
	λ Draconis, U. C.	W.	8	10 38 43.93	0.98	0.00	+ 15.56	0.12	0.02	58.65	11 24 6.15	[7.50]	.....
	υ Leonis	W.	11	10 45 32.21	0.51	0.00	— 2.15	0.04	0.02	29.61	11 30 37.77	8.16	— 0.08
	β Leonis	W.	11	10 57 38.94	0.56	— 0.02	— 0.38	0.04	0.02	38.04	11 42 46.03	7.99	+ 0.09
	γ Ursæ Majoris	W.	11	11 2 7.04	0.75	0.03	+ 6.84	0.07	0.02	13.19	11 47 21.34	8.15	— 0.07
	ο Virginis	W.	11	11 13 49.08	0.54	0.01	— 1.06	0.04	0.01	47.52	11 58 55.55	8.03	+ 0.05
	4 Draconis, U. C.	W.	6	11 20 54.11	— 1.33	— 0.02	+ 22.94	+ 0.20	+ 0.01	81.91	12 6 30.26	+45 [8.35]	.....
	4 Draconis, U. C.	E.	8	11 20 51.65	+ 1.33	+ 0.07	+ 29.34	— 0.40	+ 0.01	82.00	12 6 30.26	+45 [8.26]	.....
	ε Virginis	E.	11	12 10 54.51	0.55	0.17	— 0.82	0.08	— 0.01	54.32	12 56 2.45	8.13	— 0.05
	ε Virginis	E.	11	12 18 28.01	+ 0.50	+ 0.16	2.72	— 0.08	0.01	25.86	13 3 33.96	8.10	— 0.02
	Polaris, L. C	E.	3	12 27 292.85	— 6.68	— 1.61	278.30	+ 3.39	0.02	9.63	1 12 17.75	[8.12]	.....
	τ Bootis	E.	11	12 56 16.07	+ 0.57	+ 0.08	— 0.03	0.08	0.02	16.59	13 41 24.63	8.04	+ 0.04
	η Ursæ Majoris	E.	11	12 57 28.18	0.71	0.11	+ 5.59	0.12	0.02	34.45	13 42 42.52	8.07	+ 0.01
	η Bootis	E.	11	13 3 40.56	0.57	0.09	0.08	0.08	0.02	41.20	13 48 49.30	8.10	0.02
	α Draconis, U. C.	E.	6	13 15 46.13	+ 0.88	+ 0.16	+ 11.80	— 0.19	— 0.03	58.75	14 1 6.60	+45 [7.85]	.....

$a_1 = -6^s.775$ (circle W.); $a_2 = -6^s.868$ (circle E.); $c = -0^s.060$ (circle E.).
Chronometer No. 1254 at $11^h\ 50^m$ *slow* $45^m\ 8^s.08 \pm 0^s.010$, *gaining* $0^s.020$ per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
May 11	δ Leonis	W.	11	10 22 26.86	— 0.58	+ 0.01	— 0.05	— 0.17	+ 0.02	26.09	11 7 32.65	+45 6.56	+ 0.02
	δ Crateris	W.	11	10 28 3.56	0.47	0.02	+ 0.50	0.16	0.01	3.46	11 13 10.03	6.57	0.01
	ι Leonis	W.	11	10 32 23.42	0.55	0.06	0.11	0.16	0.01	22.89	11 17 29.40	6.51	0.07
	τ Leonis	W.	11	10 36 29.26	0.52	0.05	+ 0.23	0.16	0.01	28.87	11 21 35.37	6.50	+ 0.08
	λ Draconis, U. C.	W.	11	10 38 62.78	0.98	0.09	— 2.07	0.45	0.01	59.38	11 24 6.06	[6.68]	.....
	υ Leonis	W.	11	10 45 31.46	0.51	0.04	+ 0.29	0.16	0.01	31.13	11 30 37.75	6.62	— 0.04
	β Leonis	W.	11	10 57 40.07	0.56	0.03	+ 0.05	0.16	0.01	39.44	11 42 46.01	6.57	+ 0.01
	γ Ursæ Majoris	W.	11	11 2 16.38	0.75	0.06	— 0.91	0.27	0.01	14.52	11 47 21.30	6.78	— 0.20
	ο Virginis	W.	11	11 13 49.52	0.54	+ 0.02	+ 0.14	0.16	0.01	48.99	11 58 55.54	6.55	+ 0.03
	4 Draconis, U. C.	W.	7	11 21 29.67	— 1.33	0.00	— 3.86	— 0.76	+ 0.01	23.73	12 6 30.11	+45 [6.38]	.....
	4 Draconis, U. C.	E.	5	11 21 24.60	+ 1.33	+ 0.05	— 3.43	+ 0.57	+ 0.01	23.13	12 6 30.11	+45 [6.98]	.....
	ε Virginis	E.	11	12 10 55.00	0.55	0.09	+ 0.10	0.12	0.00	55.86	12 56 2.44	6.58	0.00
	θ Virginis	E.	11	12 18 26.37	+ 0.50	+ 0.08	0.32	+ 0.12	0.00	27.39	13 3 33.96	6.57	+ 0.01
	Polaris, L. C	E.	3	12 26 52.52	— 6.68	— 0.99	32.50	— 4.86	0.00	72.49	13 12 19.03	[6.54]	.....
	Spica	E.	11	12 33 34.38	+ 0.48	+ 0.02	0.39	+ 0.12	— 0.01	35.38	13 18 41.89	6.51	+ 0.07
	ξ Virginis	E.	11	12 43 17.25	0.51	0.02	+ 0.25	+ 0.12	0.01	18.14	13 28 24.77	6.63	— 0.05
	τ Bootis	E.	11	12 56 17.35	0.57	0.01	0.00	0.12	0.01	18.04	13 41 24.63	6.59	0.01
	η Ursæ Majoris	E.	9	12 57 35.62	0.71	0.01	— 0.73	0.18	0.01	35.78	13 42 42.51	6.73	— 0.15
	η Bootis	E.	11	13 3 42.13	0.57	0.01	0.01	0.12	0.01	42.81	13 48 49.30	6.49	+ 0.09
	α Draconis, U. C.	E.	11	13 15 60.35	+ 0.88	+ 0.03	— 1.55	+ 0.27	— 0.01	59.97	14 1 6.57	+45 [6.60]	.....

$a = +0^s.903$ (circle W.); $a_2 = +0^s.802$ (circle E.); $c = +0^s.135$ (circle E.).
Chronometer No. 1254 at $11^h\ 56^m$ *slow* $45^m\ 6^s.58 \pm 0^s.014$, *gaining* $0^s.009$ per hour.

Transits of stars observed at Christianstadt, St. Croix, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
May 12	35 Ursæ Majoris.....	W.	5	9 45 19.42	− 0.98	− 0.03	+ 0.28	− 0.06	+ 0.05	18.68	10 34 13.96	[+48 55.28]	.....
	l Leonis.....	W.	7	9 53 51.87	0.56	0.05	− 0.02	0.02	0.04	51.26	10 42 45.93	54.67	− 0.01
	β Ursæ Majoris.....	W.	9	10 5 30.07	0.78	0.07	+ 0.15	0.04	0.04	29.37	10 54 23.83	54.46	+ 0.20
	χ Leonis.....	W.	9	10 9 44.77	0.55	0.05	− 0.02	0.02	0.04	44.17	10 58 38.85	54.68	− 0.02
	θ Leonis.....	W.	9	10 18 51.67	0.57	0.06	0.00	0.02	0.04	51.06	11 7 45.75	54.69	0.03
	δ Crateris	W.	9	10 24 15.90	0.48	0.05	− 0.07	0.02	0.04	15.32	11 13 10.02	54.70	− 0.04
	Groombridge 1771..	W.	8	10 26 38.48	0.88	0.11	+ 0.24	0.05	0.04	37.70	11 15 31.77	[54.07]	.....
	τ Leonis.....	W.	8	10 33 41.15	0.54	0.07	− 0.03	0.02	0.03	40.52	11 21 35.36	54.84	− 0.18
	λ Draconis	W.	9	10 35 12.14	− 0.99	− 0.13	+ 0.29	− 0.06	0.03	11.28	11 24 6.01	[54.73]	.....
	γ Cephei, S. P.....	W.	5	10 45 18.10	+ 0.20	+ 0.03	− 0.56	+ 0.09	0.03	17.89	23 34 11.94	[54.05]	.....
	γ Cephei, S. P.....	E.	7	10 45 14.69	− 0.20	+ 0.11	+ 2.09	+ 0.09	0.03	16.81	23 34 11.94	[55.13]	.....
	β Leonis.....	E.	9	10 53 50.81	+ 0.57	− 0.05	0.02	− 0.02	0.03	51.36	11 42 46.01	54.65	+ 0.01
	β Virginis	E.	9	10 55 20.71	0.53	− 0.05	+ 0.12	0.02	0.03	21.32	11 44 15.96	54.64	+ 0.02
	Groombridge 1852..	E.	7	11 10 8.63	1.29	0.00	− 1.91	0.09	0.02	7.94	11 59 2.56	[54.62]	.....
	4 Draconis.....	E.	9	11 17 35.82	1.33	− 0.07	− 2.04	0.10	0.02	34.96	12 6 30.04	[55.08]	.....
	η Virginis.....	E.	9	11 24 46.36	0.53	0.08	+ 0.14	0.02	0.02	40.95	12 13 35.67	54.72	− 0.06
	α^1 Crucis	E.	8	11 30 49.97	0.20	0.03	1.01	0.04	0 02	51.13	12 19 44.18	53.05	+ 1.61
	β Corvi.....	E.	9	11 38 59.20	0.45	0.06	0.33	0.02	0.02	59.92	12 27 54.39	54.47	+ 0.19
	γ Virginis.....	E.	9	11 46 29.37	0.52	0.07	0.15	0.02	0.02	29.97	12 35 24.67	54.70	− 0.04
	δ Virginis.....	E.	8	12 0 28.27	+ 0.54	− 0.06	+ 0.11	− 0.02	+ 0.01	28.85	12 49 23.57	[+48 54.72	− 0.66

$a' = -0^s.127$ (circle W.); $a'' = +0^s.475$ (circle E.); $c = 0^s.001$ (+ with circle W.).
Chronometer No. 1295 at $12^h\ 50^m$ *slow* $48^m\ 54^s.66 \pm 0^s.022$, *gaining* $0^s.015$ per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
May 13	9 Draconis.....	W.	7	9 35 41.38	− 1.21	− 0.20	+ 0.64	− 0.02	− 0.05	40.54	10 24 35.43	[+48 54.89]	.....
	35 Ursæ Majoris.....	W.	7	9 45 20.34	0.98	− 0.25	+ 0.55	0.02	0.05	19.59	10 34 13.91	[54.32]	.....
	l Leonis.....	W.	9	9 53 52.03	0.56	+ 0.06	− 0.03	− 0.01	0.05	51.44	10 42 45.92	54.48	− 0.01
	46 Leonis Minoris	W.	9	9 57 30.71	0.64	0.06	+ 0.09	0.00	0.04	30.18	10 46 24.37	54.19	+ 0.28
	β Ursæ Majoris.....	W.	7	10 5 29.93	0.78	0.04	+ 0.28	+ 0.01	0.04	29.44	10 54 23.80	54.36	0.11
	χ Leonis.....	W.	9	10 9 45.02	0.55	+ 0.02	− 0.04	− 0.01	0.04	44.40	10 58 38.84	54.44	+ 0.03
	θ Leonis	W.	9	10 18 51.85	0.57	0.00	0.01	0.01	0.04	51.22	11 7 45.74	54.52	− 0.05
	δ Crateris	W.	9	10 24 16.19	0.48	0.00	− 0.13	0.01	0.04	15.53	11 13 10.01	54.48	− 0.01
	λ Draconis	W.	9	10 35 11.98	0.99	− 0.02	+ 0.56	0.02	0.03	11.48	11 24 5.97	[54.49]	.....
	3 Draconis.....	W.	6	10 46 43.23	− 0.92	0.02	− 0.49	0.01	0.03	41.76	11 35 36.75	[54.99]	.....
	3 Draconis.....	E.	6	10 46 41.06	+ 0.92	0.05	+ 0.03	0.10	0.03	41.83	11 35 36.75	[54.92]	.....
	β Leonis.....	E.	9	10 53 50.97.	0.57	0.03	0.00	0.03	0.03	51.45	11 42 46.00	54.55	− 0.08
	β Virginis.....	E.	9	10 55 21.12	0.53	0.03	0.00	0.03	0.03	21.56	11 44 15.95	54.39	+ 0.08
	o Virginis.....	E.	9	11 10 0.52	0.55	0.03	0.00	0.03	0.02	0.99	11 58 55.52	54.53	− 0.06
	4 Draconis.....	E.	6	11 17 34.22	1.33	0.05	+ 0.06	0.17	0.02	35.37	12 6 29.96	[54.59]	.....
	2 Canum Venat.....	E.	4	11 21 2.19	0.67	− 0.02	+ 0.01	0.05	0.02	2.78	12 9 57.20	54.42	+ 0.05
	γ Virginis.....	E.	5	11 46 29.75	0.52	+ 0.03	0.00	0.01	− 0.01	30.28	12 35 24.67	54.39	0.08
	ζ Virginis.....	E.	9	12 39 29.76	0.53	0.10	0.00	0.03	+ 0.01	30.37	13 28 24.77	54.40	+ 0.07
	Groombridge 2029..	E.	9	12 45 23.12	1.03	0.11	+ 0.03	0.11	0.01	24.19	13 34 18.10	[53.91]	.....
	τ Bootis	E.	9	12 52 29.51	+ 0.58	+ 0.01	0.00	− 0.03	+ 0.01	30.08	13 41 24.64	+48 54.56	− 0.09

$a' = -0^s.244$ (circle W.); $a'' = -0^s.013$ (circle E.); $c = 0^s.014$ (+ with circle W.).
Chronometer No. 1295 at $12^h\ 23^m$ *slow* $48^m\ 54^s.47 \pm 0^s.012$, *losing* $0^s.018$ per hour.

Transits of stars observed at St. Thomas (Charlotte Amalie), by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
May 12	λ Draconis, U. C	W.	7	10 38 59.84	− 0.98	+ 0.04	+ 2.22	− 0.66	+ 0.04	60.50	11 24 6.01	+45 [5.51]	.....
	υ Leonis	W.	11	10 45 33.12	0.51	0.01	− 0.31	0.22	0.04	32.13	11 30 37.75	5.62	+ 0.14
	β Leonis	W.	11	10 57 41.05	0.56	0.01	− 0.05	0.23	0.04	40.26	11 42 46.01	5.75	0.01
	γ Ursæ Majoris	W.	11	11 2 15.54	0.75	+ 0.03	+ 0.98	0.39	0.04	15.45	11 47 21.28	5.83	− 0.07
	o Virginis	W.	11	11 13 50.58	0.54	0.00	− 0.15	0.23	0.03	49.69	11 58 55.53	5.84	− 0.08
	4 Draconis, U. C	W.	9	11 21 22.38	− 1.33	+ 0.05	+ 4.14	− 1.11	+ 0.03	24.16	12 6 30.03	+45 [5.87]	.....
	4 Draconis, U. C	E.	6	11 21 16.66	+ 1.33	+ 0.10	+ 5.18	+ 0.91	+ 0.03	24.21	12 6 30.03	+45 [5.89]	.....
	η Virginis	E.	11	11 28 29.37	0.51	0.02	− 0.04	0.16	0.03	30.07	12 13 35.67	5.60	+ 0.16
	β Corvi	E.	11	11 42 48.65	+ 0.44	+ 0.04	0.86	+ 0.20	0.02	48.49	12 27 54.39	5.90	− 0.14
	Polaris, L. C	E.	4	12 27 78.20	− 6.68	− 0.74	−49.11	− 7.84	+ 0.01	13.84	1 12 19.61	+45 [5.77]	.....
	Polaris, L. C	E.	2	12 27 13.85	− 6.68	− 0.50	+15.07	− 7.84	+ 0.01	13.91	1 12 19.61	+45 [5.70]	.....
	α Draconis, U. C	E.	11	13 15 59.98	+ 0.88	+ 0.06	− 0.64	+ 0.44	− 0.01	60.71	14 1 6.56	[5.85]	.....
	Arcturus	E.	11	13 24 56.22	0.57	0.05	0.01	0.20	0.01	57.02	14 10 2.83	5.81	− 0.05
	θ Bootis	E.	11	13 35 55.55	0.73	0.04	0.34	0.30	0.01	56.27	14 21 1.97	5.70	+ 0.06
	ρ Bootis	E.	11	13 41 25.31	0.61	0.03	0.09	0.22	0.02	26.06	14 26 31.83	5.77	− 0.01
	5 Ursæ Minoris, U. C	E.	8	13 42 49.96	1.21	0.07	− 1.33	0.78	0.02	50.67	14 27 55.84	[5.17]	.....
	ξ Bootis	E.	11	13 50 9.52	0.56	0.02	+ 0.03	0.19	0.02	10.30	14 35 16.11	5.81	− 0.05
	ε Bootis	E.	11	13 54 30.47	0.60	0.02	− 0.07	0.21	0.02	31.21	14 39 36.94	5.73	+ 0.03
	α^2 Libræ	E.	11	13 58 57.08	+ 0.47	+ 0.01	+ 0.22	+ 0.19	− 0.02	57.95	14 44 3.64	+45 5.69	+ 0.07

a_1=−0ˢ.968 (circle W.); a_2=−1ˢ.212 (circle E., 1st group); a_3=+0ˢ.372 (circle E., 2d group); c=+0ˢ.205 (circle E.).
Chronometer No. 1254 at 12ʰ 53ᵐ, *slow* 45ᵐ 5ˢ.76±0ˢ.017, *gaining* 0ˢ.021 per hour.

1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
May 13	τ Leonis	W.	10	10 36 30.79	− 0.52	− 0.10	+ 0.24	− 0.17	+ 0.09	30.33	11 21 35.35	+45 5.02	+ 0.02
	λ Draconis, U. C	W.	11	10 39 4.65	0.98	0.14	− 2.11	0.49	0.09	1.02	11 24 5.97	[4.95]	.....
	υ Leonis	W.	11	10 45 33.13	0.51	0.08	+ 0.29	0.17	0.08	32.74	11 30 37.74	5.00	+ 0.04
	β Leonis	W.	11	10 57 41.74	0.56	0.10	0.05	0.17	0.07	41.03	11 42 46.00	4.97	0.07
	o Virginis	W.	11	11 13 51.13	0.54	0.07	+ 0.14	0.17	0.06	50.55	11 58 55.52	4.97	+ 0.07
	4 Draconis, U. C	W.	9	11 21 31.08	− 1.33	− 0.15	− 3.93	− 0.82	+ 0.05	24.90	12 6 29.95	+45 [5.05]	.....
	4 Draconis, U. C	E.	6	11 21 25.79	+ 1.33	− 0.10	− 2.96	+ 0.62	+ 0.05	24.73	12 6 29.95	+45 [5.22]	.....
	η Virginis	E.	11	11 28 29.66	0.51	− 0.03	+ 0.22	0.13	0.05	30.54	12 13 35.67	5.13	− 0.09
	κ Draconis, U. C	E.	11	11 43 11.39	0.99	+ 0.04	− 1.64	0.38	+ 0.03	11.19	12 28 16.12	[4.93]	.....
	ξ Virginis	E.	11	12 43 18.76	0.51	0.05	+ 0.22	0.13	− 0.02	19.65	13 28 24.77	5.12	− 0.08
	τ Bootis	E.	11	12 56 18.90	0.57	0.04	0.00	0.13	0.03	19.61	13 41 24.63	5.02	+ 0.02
	Ursæ Majoris	E.	9	12 57 37.11	0.71	0.03	− 0.56	0.20	0.03	37.46	13 42 42.49	5.03	+ 0.01
	η Bootis	E.	11	13 3 43.50	0.57	0.03	0.01	0.13	0.03	44.19	13 48 49.30	5.11	− 0.07
	α Draconis, U. C	E.	11	13 16 1.73	0.88	+ 0.03	1.19	0.30	0.04	1.71	14 1 6.54	[4.83]	.....
	Arcturus	E.	11	13 24 57.14	+ 0.57	0.00	0.02	0.14	0.05	57.78	14 10 2.83	5.05	− 0.01
	θ Bootis	E.	11	13 35 56.74	+ 0.73	0.00	− 0.64	+ 0.21	− 0.06	57.00	14 22 1.96	+45 4.96	+ 0.08

a_1 = +0ˢ.920 (circle W.); a_2 = + 0ˢ.694 (circle E.); c = +0ˢ.147 (circle E.).
Chronometer No. 1254 at 12ʰ 25ᵐ *slow* 45ᵐ 5ˢ.04 ± 0ˢ.012, *gaining* 0ˢ.048 per hour.

Transits of stars observed at San Juan, Porto Rico, by Lieut. Commander F. M. Green, U. S. N., to determine correction for sidereal chronometer Negus No. 1295.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. m. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
May 16	χ Leonis	E.	9	10 15 24.71	+ 0.55	— 0.06	— 0.03	— 0.48	— 0.02	24.67	10 58 38.81	+43 14.14	— 0.09
	ψ Ursæ Majoris	E.	9	10 19 29.38	0.69	— 0.11	+ 0.12	0.67	0.02	29.39	11 2 43.50	14.11	— 0.06
	σ Leonis	E.	9	10 31 32.13	0.54	+ 0.09	— 0.04	0.48	0.02	32.22	11 14 46.20	13.98	+ 0.07
	λ Draconis	E.	9	10 40 51.75	1.00	0.11	+ 0.44	1.39	0.02	51.89	11 24 5.83	[13.94]	.....
	3 Draconis	E.	9	10 52 22.73	0.95	+ 0.02	0.38	1.23	0.02	22.83	11 35 36.64	[13.81]	.....
	χ Ursæ Majoris	E.	9	10 56 18.33	0.71	— 0.01	+ 0.15	0.72	0.02	18.44	11 39 32.55	14.11	— 0.06
	β Leonis	E.	9	10 59 31.96	0.57	0.03	— 0.01	0.49	0.02	31.98	11 42 45.97	13.99	+ 0.06
	β Virginis	E.	7	11 1 2.09	0.53	— 0.03	— 0.05	0.47	0.01	2.06	11 44 15.93	13.87	+ 0.18
	4 Draconis	E.	5	11 23 15.37	1.36	+ 0.15	+ 0.83	2.34	0.01	15.36	12 6 29.72	[14.36]	.....
	a^1 Crucis	E.	6	11 36 33.24	+ 0.19	0.02	— 0.41	— 1.02	0.01	32.01	12 19 44.10	[12.09]	.....
	a^1 Crucis	W.	6	11 36 30.53	— 0.19	+ 0.01	1.13	+ 0.94	— 0.01	30.15	12 19 44.10	[13.95]	.....
	γ Virginis	W.	7	11 52 10.89	0.52	— 0.02	0.17	0.43	0.00	10.61	12 35 24.65	14.04	+ 0.01
	ζ Virginis	W.	9	12 45 11.16	0.52	0.18	— 0.17	0.43	+ 0.01	10.73	13 28 24.77	14.04	+ 0.01
	Groombridge 2029	W.	9	12 51 2.70	1.06	0.38	+ 1.36	1.40	0.01	4.03	13 34 18.01	[13.98]	.....
	τ Bootis	W.	9	12 58 10.82	0.58	0.24	— 0.01	0.46	0.01	10.46	13 41 24.64	14.18	— 0.13
	η Ursæ Majoris	W.	7	12 59 28.27	0.73	0.29	+ 0.43	0.67	0.01	28.36	13 42 42.47	14.11	0.06
	η Bootis	W.	9	13 5 35.54	0.58	0.20	0.01	0.46	0.01	35.24	13 48 49.30	14.06	0.01
	11 Bootis	W.	9	13 12 22.03	0.62	0.21	0.10	0.49	0.01	21.80	13 55 35.70	13.90	— 0.15
	α Draconis	W.	7	13 17 51.90	— 0.89	— 0.31	+ 0.90	+ 1.02	+ 0.01	52.63	14 1 6.50	[+43 13.87]	.....

$a' = -0^s.194$ (circle E.); $a'' = -0^s.529$ (circle W.); $c = 0^s.454$ (+ with circle W.).
Chronometer No. 1295 at $12^h\ 10^m$ *slow* $43^m\ 14^s.05 \pm 0^s.018$, *losing* $0^s.013$ per hour.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				h. mi. s.	s.	s.	s.	s.	s.	s.	h. m. s.	m. s.	s.
May 19	λ Draconis	E.	7	10 40 53.21	+ 1.00	+ 0.36	— 1.29	— 1.26	— 0.03	51.99	11 24 5.69	[+43 13.70]	.....
	υ Leonis	E.	9	10 47 24.34	0.52	0.12	+ 0.18	0.43	0.03	24.70	11 30 37.68	12.98	+ 0.08
	3 Draconis	E.	9	10 52 23.85	0.95	0.15	— 1.10	1.12	0.02	22.71	11 35 36.52	[13.81]	.....
	χ Ursæ Majoris	E.	9	10 56 19.48	0.71	0.06	— 0.42	0.65	0.02	19.16	11 39 32.50	13.34	— 0.28
	β Leonis	E.	9	10 59 32.59	0.57	+ 0.01	+ 0.03	0.45	0.02	32.73	11 42 45.94	13.21	— 0.15
	β Virginis	E.	9	11 1 2.69	0.53	0.00	0.16	0.43	— 0.02	2.93	11 44 15.91	12.98	+ 0.08
	δ Virginis	E.	9	12 6 10.11	0.54	+ 0.18	0.14	0.43	+ 0.01	10.55	12 49 23.54	12.99	+ 0.07
	ε Virginis	E.	8	12 12 49.04	+ 0.56	+ 0.11	0.07	— 0.45	0.01	49.34	12 56 2.42	13.08	— 0.02
	Polaris, S. P.	E.	3	12 28 36.30	— 6.86	— 1.12	22.74	+18.20	0.02	9.28	1 12 23.67	[14.39]	.....
	Polaris, S. P.	W.	3	12 28 40.82	+ 6.86	— 2.87	43.30	—16.52	0.02	11.61	1 12 23.67	[12.06]	.....
	α Virginis	W.	9	12 35 28.17	— 0.49	+ 0.20	+ 0.52	+ 0.40	0.03	22.83	13 18 41.87	13.04	+ 0.02
	Groombridge 2001	W.	9	12 39 53.78	1.09	0.46	— 2.96	1.34	0.03	51.56	13 23 4.03	[12.47]	.....
	ζ Virginis	W.	9	12 45 11.20	0.52	0.21	+ 0.34	0.39	0.03	11.65	13 28 24.76	13.11	— 0.05
	τ Bootis	W.	9	12 58 11.45	0.58	0.22	+ 0.01	0.41	0.04	11.55	13 41 24.63	13.08	0.02
	η Ursæ Majoris	W.	7	12 59 29.90	0.73	0.26	— 0.86	0.61	0.04	29.22	13 42 42.44	13.22	0.16
	η Bootis	W.	8	13 5 36.23	0.58	0.21	— 0.01	0.41	0.04	36.30	13 48 49.30	13.00	+ 0.06
	τ Virginis	W.	9	13 12 9.09	0.53	0.18	+ 0.30	0.39	0.04	9.47	13 55 22.50	13.03	+ 0.03
	α Draconis	W.	7	13 17 54.83	— 0.89	+ 0.31	— 1.81	+ 0.92	+ 0.05	53.41	14 1 6.44	[+43 13.03]	.....

$a' = +0^s.562$ (circle E.); $a'' = +1^s.061$ (circle W.); $c = 0^s.410$ (+ with circle W.).
Chronometer No. 1295 at $11^h\ 41^m$ *slow* $43^m\ 13^s.06 \pm 0^s.918$, *losing* $0^s.028$ per hour.

Transits of stars observed at St. Thomas (Charlotte Amalie), by Miles Rock, Esq., to determine correction for sidereal chronometer Negus No. 1254.

Date.	Name of star.	Circle.	Number of threads.	Transit over mean of threads.	Flexure.	Level.	Azimuth.	Diurnal aberration and collimation.	Rate.	Seconds of corrected transit.	Right ascension.	Chronometer correction.	v.
1876.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
May 16	Polaris, L. C	E.	2	12 27 19.35	— 6.68	+ 0.62	+ 9.68	— 3.81	— 0.01	19.15	1 12 21.77	+45 [2.62]	.....
	ζ Virginis	E.	11	12 43 21.49	+ 0.51	— 0.05	+ 0.08	+ 0.09	0.01	22.11	13 28 24.76	2.65	+ 0.03
	τ Bootis	E.	11	12 56 21.39	0.57	0.08	0.00	0.09	0.01	21.96	13 41 24.63	2.67	0.01
	η Ursæ Majoris.....	E.	9	12 57 39.36	0.71	0.13	— 0.19	0.14	0.01	39.82	13 42 42.47	2.65	0.03
	η Bootis	E.	11	13 3 46.04	0.57	0.07	0.00	0.10	0.01	46.63	13 48 49.30	2.67	+ 0.01
	α Draconis, U. C	E.	6	13 16 3.54	+ 0.88	— 0.18	— 0.41	+ 0.21	— 0.01	4.03	14 1 6.49	+45 [2.46]	.....
	α Draconis, U. C	W.	9	13 16 5.82	— 0.88	— 0.15	— 0.83	— 0.31	— 0.01	3.64	14 1 6.49	+45 [2.85]	.....
	Arcturus	W.	11	13 25 1.10	0.57	0.13	0.01	0.14	0.02	0.23	14 10 2.84	2.61	+ 0.07
	θ Bootis	W.	11	13 35 60.62	0.73	0.18	0.44	0.21	0.02	59.04	14 21 1.95	2.91	— 0.23
	ρ Bootis	W.	11	13 41 30.14	0.61	0.18	0.12	0.15	0.02	29.06	14 26 31.84	2.78	— 0.10
	5 Ursæ Minoris, U. C	W.	8	13 42 57.09	1.21	0.36	— 1.72	0.55	0.02	53.23	14 27 55.73	[2.50]	.....
	ζ Bootis	W.	11	13 50 14.33	0.56	0.15	+ 0.04	0.13	0.02	13.51	14 35 16.13	2.62	+ 0.06
	ε Bootis	W.	11	13 54 35.22	0.60	0.12	— 0.09	0.15	0.02	34.24	14 39 36.95	2.71	— 0.03
	a^2 Libræ...	W.	11	13 59 1.65	— 0.47	— 0.13	+ 0.28	— 0.14	— 0.03	1.16	14 44 3.67	+45 2.51	+ 0.17

$a_1 = + 0^s.239$ (circle E.); $a_2 = + 0^s.483$ (circle W.); $c = + 0^s.110$ (circle E.).
Chronometer No. 1254 at $12^h\ 13^m$ *slow* $45^m\ 2^s.67 \pm 0^s.022$, *gaining* $0^s.014$ per hour.

1876.				*h. m. s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*	*h. m. s.*	*m. s.*	*s.*
May 19	υ Leonis	W.	5	10 45 37.94	— 0.51	— 0.09	+ 0.16	+ 0.11	+ 0.02	37.63	11 30 37.68	+45 0.05	+ 0.09
	β Leonis	W.	11	10 57 46.27	0.56	0.09	0.03	0.11	0.02	45.78	11 42 45.94	0.16	— 0.02
	ο Virginis	W.	8	11 13 55.76	0.54	0.09	+ 0.08	0.11	0.01	55.33	11 58 55.48	0.15	— 0.01
	4 Draconis, U. C	W.	7	11 21 31.91	1.33	0.15	— 2.22	0.55	+ 0.01	28.77	12 6 29.48	+45 [0.71]	.....
	32 Camelopard., U. C..	W.	5	12 3 34.71	— 2.15	— 0.12	— 4.60	+ 1.08	— 0.01	28.91	12 48 28.77	+44 [59.86]	.....
	32 Camelopard., U. C..	E.	4	12 3 30.90	+ 2.15	— 0.12	— 3.48	— 1.47	— 0.01	27.97	12 48 28.77	+45 [0.80]	.....
	ε Virginis	E.	11	12 11 1.88	0.55	0.08	+ 0.05	0.15	0.01	2.24	12 56 2.41	0.17	— 0.03
	θ Virginis	E.	11	12 18 33.28	+ 0.50	— 0.05	0.16	— 0.15	0.01	33.73	13 3 33.94	0.21	— 0.07
	Polaris, L. C	E.	4	12 27 7.65	— 6.68	+ 0.12	15.92	+ 6.40	0.02	23.39	1 12 23.67	[0.28]	.....
	Spica	E.	11	12 33 41.24	+ 0.48	— 0.05	0.19	— 0.15	0.02	41.69	13 18 41.87	0.18	— 0.04
	ζ Virginis	E.	11	12 43 24.24	0.51	0.07	+ 0.12	0.15	0.02	24.63	13 28 24.76	0.13	+ 0.01
	τ Bootis	E.	11	12 56 24.21	0.57	0.07	0.00	0.16	0.03	24.52	13 41 24.63	0.11	+ 0.03
	η Ursæ Majoris, U. C.	E.	9	12 57 42.19	0.71	0.08	— 0.32	0.24	0.03	42.23	13 42 42.44	0.21	— 0.07
	η Bootis	E.	11	13 3 48.87	0.57	0.06	0.00	0.16	0.03	49.19	13 48 49.30	0.11	+ 0.03
	α Draconis, U. C	E.	4	13 16 6.74	0.88	0.13	— 0.68	0.36	0.04	6.41	14 1 6.44	[0.03]	.....
	Arcturus	E.	11	13 25 2.55	+ 0.57	— 0.08	— 0.01	— 0.16	— 0.04	2.83	14 10 2.84	0.01	+ 0.13

$a_1 = + 0^s.520$ (circle W.); $a_2 = + 0^s.393$ (circle E.); $c = - 0^s.131$ (circle E.).
Chronometer No. 1254 at $11^h\ 44^m$ *slow* $45^m\ 0^s.14 \pm 0^s.013$, *gaining* $0^s.026$ per hour.

Differences of longitude deduced from exchange of signals.

Eastern station. Western station.	Date.	Observer.	Position of observer.	Number of time stars observed.	Chronometer correction. ΔT_e { + slow. ΔT_w { − fast.	Excess of correction of eastern chronometer. $\Delta T_e - \Delta T_w$.	Number of chronometer comparisons.	Comparison of chronometers by E. and W. signals. T and T'.	Difference of longitude by E. and W. signals. λ' and λ''.	Difference of longitude for each night. $\frac{1}{2}(\lambda' + \lambda'')$.	Wave and armature time. $\frac{1}{2}(\lambda' - \lambda'')$.
					m. s. s.	*m. s.*		*m. s.*	*m. s.*	*m. s.*	*s.*
Panama	Dec. 23, 1874	R.	E.	10	− 8 48.43 ± 0.017	+ 1 28.47	36	+ 0 1.75	1 30.22	1 30.19	0.031
Aspinwall		G.	W.	16	−10 16.90 .011		38	+ 0 1.69	1 30.16		
Panama	Dec. 24, 1874	R.	E.	12	− 8 47.85 .016	+ 1 24.06	36	+ 0 6.26	1 30.32	1 30.28	0.041
Aspinwall		G.	W.	9	−10 11.91 .039		26	+ 0 6.18	1 30.24		
Panama	Jan. 4, 1875	R.	E.	13	− 8 43.90 .016	+ 1 37.79	36	− 0 7.54	1 30.25	1 30.21	0.040
Aspinwall		G.	W.	5	−10 21.69 .048		39	− 0 7.62	1 30.17		
Panama	Jan. 5, 1875	R.	E.	14	− 8 43.68 .019	+ 1 38.49	39	− 0 8.32	1 30.17	1 30.14	0.034
Aspinwall		G.	W.	17	−10 82.37 ± 0.020		39	− 0 8.38	1 30.11		
										1 30.205	0.037
Kingston	Jan. 25, 1875	G.	E.	13	+ 1 53.61 ± 0.036	+12 8.76	38	+ 0 19.59	12 28.35	12 27.95	0.398
Aspinwall		R.	W.	14	−10 15.14 .018		60	+ 0 18.79	12 27.55		
Kingston	Jan. 26, 1875	G.	E.	12	+ 1 53.51 .019	+12 8.90	37	+ 0 19.53	12 28.43	12 28.01	0.416
Aspinwall		R.	W.	13	−10 15.38 .016		61	+ 0 18.70	12 27.60		
Kingston	Jan. 28, 1875	G.	E.	14	+ 1 52.50 .020	+12 8.58	44	+ 0 19.60	12 28.18	12 27.81	0.370
Aspinwall		R.	W.	13	−10 16.06 .016		36	+ 0 18.86	12 27.44		
Kingston	Jan. 29, 1875	G.	E.	14	+ 1 52.86 .017	+12 9.15	38	+ 0 19.13	12 28.28	12 27.90	0.375
Aspinwall		R.	W.	15	−10 16.27 ± 0.010		37	+ 0 18.38	12 27.53		
										12 27.918	0.390
Santiago de Cuba	Feb. 23, 1875	G.	E.	12	+ 5 28.60 ± 0.015	+ 2 43.37	37	+ 1 5.71	3 49.08	3 48.78	0.300
Kingston		R.	W.	13	+ 2 45.25 .017		48	+ 1 5.11	3 48.48		
Santiago de Cuba	Feb. 24, 1875	G.	E.	16	+ 5 28.17 .014	+ 2 39.53	49	+ 1 9.63	3 49.16	3 48.84	0.318
Kingston		R.	W.	14	+ 2 48.67 .018		50	+ 1 8.99	3 48.52		
Santiago de Cuba	Feb. 25, 1875	G.	E.	13	+ 5 27.78 .022	+ 2 35.49	37	+ 1 13.45	3 48.94	3 48.63	0.311
Kingston		R.	W.	14	+ 2 52.29 .009		36	+ 1 12.83	3 48.32		
Santiago de Cuba	Feb. 28, 1875	G.	E.	20	+ 5 26.17 .019	+ 2 23.97	37	+ 1 25.14	3 49.11	3 48.81	0.295
Kingston		R.	W.	14	+ 3 2.33 ± 0.022		39	+ 1 24.55	3 48.52		
										3 48.765	0.306
Santiago de Cuba	Mar. 19, 1875	R.	E.	14	+ 7 51.19 ± 0.030	+28 40.12	51	− 2 36.51	26 3.61	26 3.21	0.400
Havana		G.	W.	10	−20 48.93 .025		39	− 2 37.31	26 2.81		
Santiago de Cuba	Mar. 20, 1875	R.	E.	14	+ 7 54.25 .014	+28 43.58	59	− 2 39.99	26 3.59	26 3.19	0.400
Havana		G.	W.	15	−20 49.38 .015		63	− 2 40.79	26 2.79		
Santiago de Cuba	Mar. 24, 1875	R.	E.	13	+ 8 5.94 .019	+28 57.62	61	− 2 54.04	26 3.58	26 3.21	0.366
Havana		G.	W.	14	−20 51.73 .010		61	− 2 54.77	26 2.85		
Santiago de Cuba	Mar. 25, 1875	R.	E.	15	+ 8 8.82 .012	+29 0.83	61	− 2 57.20	26 3.63	26 3.26	0.366
Havana		G.	W.	16	−20 52.04 ± 0.018		63	− 2 57.93	26 2.90		
										26 3.218	0.383
Key West	Nov. 26, 1875	R.	E.	11	−19 59.06 ± 0.012	+ 1 15.68	69	+ 0 55.82	2 11.50	2 11.44	0.063
Havana		G.	W.	8	−21 14.76 .014		65	+ 0 55.70	2 11.38		
Key West	Nov. 27, 1875	R.	E.	11	−19 59.66 .013	+ 1 15.09	64	+ 0 56.39	2 11.45	2 11.40	0.079
Havana		G.	W.	10	−21 14.75 .014		64	+ 0 56.23	2 11.32		
Key West	Nov. 28, 1875	R.	E.	11	−20 0.15 .021	+ 1 14.76	64	+ 0 56.91	2 11.67	2 11.59	0.083
Havana		G.	W.	11	−21 14.94 .015		63	+ 0 56.75	2 11.51		
Key West	Nov. 29, 1875	R.	E.	9	−20 0.75 .016	+ 1 14.03	61	+ 0 57.55	2 11.58	2 11.49	0.088
Havana		G.	W.	11	−21 14.83 ± 0.014		61	+ 0 57.37	2 11.40		
										2 11.480	0.078

Differences of longitude deduced from exchange of signals.

Eastern station. Western station.	Date.	Observer.	Position of observer.	Number of time stars observed.	Chronometer correction. ΔT_e } { +slow. ΔT_w } { −fast.	Excess of correction of eastern chronometer. $\Delta T_e - \Delta T_w$.	Number of chronometer comparisons.	Comparison of chronometers by E. and W. signals. T' and T''.	Difference of longitude by E. and W. signals. λ' and λ''.	Difference of longitude for each night. $\frac{1}{2}(\lambda' + \lambda'')$.	Wave and armature time. $\frac{1}{2}(\lambda' - \lambda'')$.
					m. s. s.	m. s.		m. s.	m. s.	m. s.	s.
St. Thomas	Jan. 10, 1876	G.	E.	14	+48 23.58 ± 0.017	+48 51.63	64	− 1 24.13	47 27.50	47 27.07	0.426
Kingston		R.	W.	12	− 0 28.05 .017		62	− 1 24.98	47 26.65		
St. Thomas	Jan. 12, 1876	G.	E.	13	+48 23.07 .014	+48 53.11	65	− 1 25.46	47 27.65	47 27.21	0.437
Kingston		R.	W.	12	− 0 30.04 .024		64	− 1 26.33	47 26.78		
St. Thomas	Jan. 13, 1876	G.	E.	12	+48 22.83 .009	+48 53.83	63	− 1 26.20	47 27.63	47 27.17	0.457
Kingston		R.	W.	14	− 0 31.03 .009		59	− 1 27.12	47 26.71		
St. Thomas	Jan. 14, 1876	G.	E.	12	+48 22.59 .011	+48 54.66	64	− 1 27.03	47 27.63	47 27.19	0.435
Kingston		R.	W.	12	− 0 32.07 ± .010		63	− 1 27.90	47 26.76		
										47 27.160	0.439
Antigua	Feb. 4, 1876	G.	E.	10	+60 39.35 ± 0.017	+13 59.40	49	− 1 37.94	12 21.46	12 21.07	0.394
St. Thomas		R.	W.	15	+46 39.95 .014		39	− 1 38.72	12 20.68		
Antigua	Feb. 7, 1876	G.	E.	8	+60 38.77 .019	+14 1.93	39	− 1 40.69	12 21.24	12 20.91	0.324
St. Thomas		R.	W.	15	+46 36.82 ± .012		39	− 1 41.34	12 20.59		
										12 20.990	0.359
Trinidad	Feb. 15, 1876	G.	E.	11	+61 57.02 ± 0.016	+15 22.80	63	− 1 47.68	13 41.12	13 40.73	0.394
St. Thomas		R.	W.	14	+46 28.16. .012		65	− 1 48.46	13 40.34		
Trinidad	Feb. 16, 1876	G.	E.	12	+61 56.93 .021	+15 29.80	64	− 1 48.51	13 41.29	13 40.86	0.424
St. Thomas		R.	W.	14	+46 27.13 .016		64	− 1 49.36	13 40.44		
Trinidad	Feb. 17, 1876	G.	E.	9	+61 56.77 .010	+15 31.02	64	− 1 49.76	13 41.26	13 40.82	0.434
St. Thomas		R.	W.	12	+46 25.75 .018		63	− 1 50.63	13 40.39		
Trinidad	Feb. 18, 1876	G.	E.	12	+61 56.61 .018	+15 32.10	61	− 1 50.74	13 41.36	13 40.95	0.404
St. Thomas		R.	W.	12	+46 24.51 ± 0.016		61	− 1 51.55	13 40.55		
										13 40.840	0.414
Barbados	Mar. 12, 1876	G.	E.	10	+ 69 27.40 ± 0.017	+ 9 44.07	64	− 2 10.25	7 33.82	7 33.47	0.344
Trinidad		R.	W.	16	+ 59 43.33 .015		62	− 2 10.94	7 33.13		
Barbados	Mar. 13, 1876	G.	E.	12	+ 69 27.52 .017	+ 9 45.25	65	− 2 11.35	7 33.89	7 33.54	0.349
Trinidad		R.	W.	18	+ 59 42.27 .011		64	− 2 12.05	7 33.20		
Barbados	Mar. 14, 1876	G.	E.	14	+ 69 27.58 .007	+ 9 46.27	63	− 2 12.40	7 33.87	7 33.54	0.329
Trinidad		R.	W.	17	+ 59 41.31 ± 0.013		59	− 2 13.06	7 33.21		
										7 33 518	0.340
Martinique	Mar. 25, 1876	G.	E.	10	+ 63 10.68 ± 0.014	+ 3 39.29	65	− 2 21.02	1 18.27	1 17.94	0.321
Trinidad		R.	W.	16	+ 59 31.39 .009		65	− 2 21.67	1 17.62		
Martinique	Mar. 26, 1876	G.	E.	13	+ 63 10.71 .021	+ 3 40.26	64	− 2 21.92	1 18.34	1 18.00	0.333
Trinidad		R.	W.	15	+ 59 30.45 .014		59	− 2 22.59	1 17.67		
Martinique	Mar. 29, 1876	G.	E.	10	+ 63 10.28 .023	+ 3 42.81	65	− 2 24.57	1 18.22	1 17.86	0.359
Trinidad		R.	W.	12	+ 59 27.47 ± 0.010		62	− 2 25.28	1 17.51		
										1 17.933	0.338
St. Croix	April 29, 1876	R.	E.	14	+ 46 12.26 ± 0.012	− 1 50.74	65	+ 2 45.49	0 54.75	0 54.48	0.270
St. Thomas		G.	W.	11	+ 48 3.00 .015		64	+ 2 44.95	0 54.21		
St. Croix	May 2, 1876	R.	E.	11	+ 46 9.25 .020	− 1 53.53	65	+ 2 48.30	0 54.77	0 54.52	0.248
St. Thomas		G.	W.	9	+ 48 2.78 .007		65	+ 2 47.81	0 54.28		
St. Croix	May 3, 1876	R.	E.	14	+ 46 8.30 .008	− 1 54.69	60	+ 2 49.26	0 54.57	0 54.35	0.219
St. Thomas		G.	W.	11	+ 48 2.99 .011		64	+ 2 48.82	0 54.13		
St. Croix	May 4, 1876	R.	E.	14	+ 46 7.36 .013	− 1 55.47	63	+ 2 50.06	0 54.59	0 54.33	0.264
St. Thomas		G.	W.	13	+ 48 2.83 ± 0.015		65	+ 2 49.54	0 54.07		
										0. 54. 42	0. 250

Differences of longitude deduced from exchange of signals.

Eastern station. Western station.	Date.	Observer.	Position of observer.	Number of time stars observed.	Chronometer correction. ΔT_e ΔT_w { + slow. — fast.	Excess of correction of eastern chronometer. $\Delta T_e - \Delta T_w$.	Number of chronometer comparisons.	Comparison of chronometers by E. and W. signals. T' and T''.	Difference of longitude by E. and W. signals. λ' and λ''.	Difference of longitude for each night. $\frac{1}{2}(\lambda' + \lambda'')$.	Wave and armature time. $\frac{1}{2}(\lambda' - \lambda'')$.
					m. s. *s.*	*m. s.*		*m. s.*	*m. s.*	*m. s.*	*s.*
St. Croix	May 9, 1876	G.	E.	13	+ 48 55.49 ± 0.022	+ 3 47.41	64	— 2 52.78	0 54.63	0 54.40	0.229
St. Thomas		R.	W.	12	+ 45 8.08 .010		71	— 2 53.24	0 54.17		
St. Croix	May 11, 1876	G.	E.	12	+ 48 54.94 .015	+ 3 48.36	60	— 2 53.78	0 54.58	0 54.38	0.193
St. Thomas		R.	W.	15	+ 45 6.58 .014		62	— 2 54.17	0 54.19		
St. Croix	May 12, 1876	G.	E.	13	+ 48 54.66 .022	+ 3 48.90	52	— 2 54.13	0 54.77	0 54.48	0.282
St. Thomas		R.	W.	12	+ 45 5.76 .021		62	— 2 54.69	0. 54.20		
St. Croix	May 13, 1876	G.	E.	13	+ 48 54.47 .012	+ 3 49.43	63	— 2 54.53	0 54.90	0 54.61	0.288
St. Thomas		R.	W.	11	+ 45 5.04 ± 0.012		64	— 2 55.11	0 54.32		
										0 54.47	0.248
St. Thomas	May 16, 1876	R.	E.	10	+ 45 2.67 ± 0.022	+ 1 48.62	64	+ 2 56.97	4 45.59	4 45.33	0.256
Porto Rico		G.	W.	12	+ 43 14.05 .018		61	+ 2 56.46	4 45.08		
St. Thomas	May 19, 1876	R.	E.	11	+ 45 0.14 .013	+ 1 47.08	62	+ 2 58.55	4 45.63	4 45.36	0.268
Porto Rico		G.	W.	12	43 13.06 ± 0.018		63	+ 2 58.01	4 45.09		
										4 45.345	0.262

LATITUDE.

As any error in the declinations of the stars observed for latitude determinations directly affects the resulting latitude, it was important to use the most accurately-determined places for such stars, and in order to do this, all stars observed during the season of 1874–'75 at Panama, Aspinwall, Kingston, and Santiago de Cuba were observed after the return of the parties, at the United States Naval Observatory, and their places determined with great care under the direction of Prof. J. R. Eastman, U. S. N. During the season of 1875–'76 only such stars were used as could be found in the Nautical Almanac, the Berlin Star List, or the Greenwich catalogues. The reductions to apparent place were all computed by Lieutenant Norris, U. S. N., the final latitude reductions being made by Mr. Rock.

In reducing the observations for latitude the following notation has been used:

Let

φ = the latitude of the station;

δ_n = apparent declination of the northern star;

δ_s = apparent declination of the southern star;

z_n = zenith distance of the northern star;

z_s = zenith distance of the southern star;

z_o = zenith distance corresponding to zero reading of micrometer;

m_n and m_s = the micrometer reading for northern and southern stars in seconds of arc;

M_n and M_s = the micrometer reading for northern and southern stars in micrometer revolutions;

l_n and l_s = state of level for northern and southern stars in seconds of arc;

L_n and L_s = state of level for northern and southern stars in level divisions;

N_n and S_n = reading of north and south ends of level-bubble for northern star;

N_s and S_s = reading of north and south ends of level-bubble for southern star;

F = flexure constant $\begin{cases} 8''.25 \text{ for transit No. 1;} \\ 8''.10 \text{ for transit No. 2;} \end{cases}$

f_n and f_s = $F \sin z_n$ and $F \sin z_s$ = correction for flexure of axis for northern and southern stars in seconds of arc;

r_n and r_s = value of mean refraction at z_n and z_s.

In these observations either one of two cases may occur, viz:

Case I. $\begin{cases} \text{When the circle is east for north star} \\ \text{and is west for south star} \end{cases}$ $\Big\}$ the micrometer reading increases as the zenith distance decreases.

Case II. $\begin{cases} \text{When the circle is east for south star} \\ \text{and is west for north star} \end{cases}$ $\Big\}$ the micrometer reading increases as the zenith distance increases.

Hence in Case I

$$z_n = z_o - m_n + l_n + f_n + r_n$$

$$z_s = z_o - m_s + l_s + f_s + r_s$$

$$z_s - z_n = (m_n - m_s) - (l_n - l_s) - (f_n - f_s) - (r_n - r_s).$$

And in Case II

$$z_n = z_o + m_n - l_n + f_n + r_n$$
$$z_s = z_o + m_s - l_s + f_s + r_s$$
$$z_s - z_n = -(m_n - m_s) + (l_n - l_s) - (f_n - f_s) - (r_n - r_s).$$

Now, since

$$\varphi = \delta_s + z_s = \delta_n - z_n = \tfrac{1}{2}(\delta_n + \delta_s) + \tfrac{1}{2}(z_n - z_s).$$

Then in Case I

$$\varphi = \tfrac{1}{2}(\delta_n + \delta_s) + \tfrac{1}{2}(m_n - m_s) - \tfrac{1}{2}(l_n - l_s) - \tfrac{1}{2}(f_n - f_s) - \tfrac{1}{2}(r_n - r_s).$$

And in Case II

$$\varphi = \tfrac{1}{2}(\delta_n + \delta_s) - \tfrac{1}{2}(m_n - m_s) + \tfrac{1}{2}(l_n - l_s) - \tfrac{1}{2}(f_n - f_s) - \tfrac{1}{2}(r_n - r_s).$$

In which

$$\tfrac{1}{2}(m_n - m_s) = \tfrac{1}{2}(M_n - M_s) \times \begin{cases} 65''.80 \text{ for transit No. 1} \\ 66''.83 \text{ for transit No. 2} \end{cases}$$

$$\tfrac{1}{2}(l_n - l_s) = \tfrac{1}{2}(L_n - L_s) \times 1''.00 = \tfrac{1}{2}\left(\frac{(N_n - S_s) + (S_n - N_s)}{2}\right) \times 1''.00$$

$$\tfrac{1}{2}(f_n - f_s) = \tfrac{1}{2}(m_n - m_s) \times \begin{cases} 0.024 & \text{for } z = 0^\circ \\ 0.022 & \text{for } z = 20^\circ \\ 0.020 & \text{for } z = 30^\circ \end{cases}$$

$$\tfrac{1}{2}(r_n - r_s) = \tfrac{1}{2}(m_n - m_s) \times \begin{cases} 0.0167 \text{ for } z = 0^\circ \\ 0.0200 \text{ for } z = 20^\circ \\ 0.0225 \text{ for } z = 30^\circ \end{cases}$$

These values for differential refraction are taken from Bessel's tables, as given in Chauvenet's Astronomy. The stars were always observed on the meridian, or so nearly so as to need no correction for reduction to the meridian; otherwise the correction $X = (6.1347)\, \tau^2 \sin 2\,\delta$ should be applied where $\tau =$ the star's hour angle in seconds of time.

Latitude of observing station, Santiago de Cuba, from zenith telescope observations, Mr. M. Rock, observer.

Date.	B. A. C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections.			Latitude.	v.
				Micrometer	Level and flexure.	Ref.		
1875.		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	″
Mar. 13	2901	+ 6 8 15.9	+ 19 56 42.25	+ 3 31.26	+ 1.25	+ 0.06	+ 20 0 14.8	0.0
	2984	33 45 8.6						
	3105	5 35 24.8	19 59 25.15	+ 0 46.51	+ 3.05	+ 0.02	20 0 14.7	0.1
	3112	34 23 25.5						
	3146	2 50 22.2	20 5 8.2	− 4 51.11	− 1.46	− 0.10	20 0 15.5	0.7
	3162	37 19 54.2						
	3178	34 55 14.7	20 3 58.35	3 47.36	+ 3.34	0.07	20 0 14.3	0.5
	3295	5 12 42.0						
	3317	30 32 53.3	20 2 8.7	− 1 53.21	− 2.00	− 0.03	20 0 13.5	1.3
	3398	9 31 24.1						
	3423	22 33 3.3	19 57 38.6	+ 2 34.39	+ 2.40	+ 0.04	20 0 15.4	0.6
	3453	17 22 13.9						
	3532	2 54 58.9	20 7 53.35	− 7 37.14	− 2.96	− 0.14	20 0 13.1	1.7
	3572	37 20 47.8						
	3572	37 20 47.8	20 4 4.7	3 53.32	+ 1.29	0,08	20 0 12.6	2.2
	3600	2 47 21.6						
	3625	36 58 35.4	20 3 34.55	− 3 17.03	− 0.05	− 0.06	20 0 17.4	2.6
	3684	3 8 33.7						
Mar. 14	2238	23 44 58.5	20 0 1.4	+ 0 17.04	− 2.20	0.00	20 0 16.2	1.4
	2285	16 15 4.3						
	2322	9 22 26.6	19 54 45.0	5 30.16	+ 1.71	+ 0.10	20 0 17.0	2.2
	2340	30 27 3.4						
	2398	16 45 55.3	19 58 31.85	+ 1 43.52	− 0.90	+ 0.03	20 0 14.0	0.8
	2434	23 11 8.4						
	2444	11 54 47.5	20 2 37.65	− 2 21.49	0.35	− 0.04	20 0 15.8	1.0
	2469	28 10 27.8						
	2605	19 38 40.3	19 55 44.1	+ 4 33.74	− 3.09	+ 0.08	20 0 14.8	0.0
	2632	20 12 47.9						
	2659	17 39 2.1	20 2 8.1	− 1 54.01	+ 0.85	− 0.03	20 0 14.9	0.1
	2676	22 25 14.1						
	2720	14 0 13.4	19 56 42.05	+ 3 35.07	− 2.99	+ 0.06	20 0 14.2	0.6
	2730	25 53 10.7						
	2788	21 8 28.8	19 56 14.0	4 2.00	0.64	0.07	20 0 15.4	0.6
	2799	18 43 59.2						
	2901	6 8 15.9	19 56 42.25	3 32.53	0.69	0.06	20 0 14.2	0.6
	2984	33 45 8.6						
	3105	5 35 24.8	19 59 25.15	+ 0 51.67	0.80	+ 0.02	20 0 16.0	1.2
	3112	34 23 25.5						
	3178	34 55 14.7	20 3 58.35	− 3 42.15	1.16	− 0.07	20 0 15.0	0.2
	3295	5 12 42.0						
	3317	30 32 53.3	20 2 8.7	− 1 51.61	5.22	− 0.03	20 0 11.8	3.0
	3398	9 31 24.1						
	3423	22 33 3.3	19 57 38.6	+ 2 39 33	1.60	+ 0.04	20 0 16.4	1.6
	3453	17 22 13.9						
	3469	16 19 9.5	20 1 31.9	− 1 10.84	6.65	− 0.02	20 0 14.4	0.4
	3511	23 43 54.3						
	3532	2 54 58.9	20 7 53.35	7 39.68	0.16	0.14	20 0 13.4	1.4
	3572	37 20 47.8						
	3572	37 20 47.8	20 4 4.7	3 48.43	2.86	0.08	20 0 13.3	1.5
	3600	2 47 21.6						
	3625	36 58 35.4	20 3 34.55	− 3 15.96	0.91	− 0.06	20 0 17.6	2.8
	3684	3 8 33.7						
Mar. 15	2322	9 22 26.6	19 54 45.0	+ 5 31.63	− 0.34	+ 0.10	20 0 16.4	1.6
	2340	30 27 3.4						
	2398	16 45 55.3	19 58 31.85	1 38.97	+ 3.95	0.03	20 0 14.8	0.0
	2434	23 11 8.4						
	2605	19 38 40.3	19 55 44.1	+ 4 31.47	− 0.94	+ 0.08	20 0 14.7	0.1
	2632	20 12 47.9						
	2659	17 39 2.1	+ 20 2 8.1	− 1 58.96	+ 4.55	− 0.03	+ 20 0 13.7	1.1
	2676	+ 22 25 14.1						

Latitude of observing station, Santiago de Cuba.—Continued.

Date.	B. A. C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections.			Latitude.	v.
				Micrometer.	Level and flexure.	Ref.		
1875.		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	″
Mar. 15	2720	+ 14 0 13.4	+ 19 56 42.05	+ 3 36.08	− 3.04	+ 0.06	+ 20 0 15.2	0.4
	2730	25 53 10.7						
	2901	6 8 15.9	19 56 42.25	3 34.27	− 0.69	0.06	20 0 15.9	1.1
	2984	33 45 8.6						
	3105	5 35 24.8	19 59 25.15	+ 0 47.05	+ 2.55	+ 0.02	20 0 14.8	0.0
	3112	34 23 25.5						
	3146	2 50 22.2	+ 19 5 8.2	− 4 53.86	− 1.41	− 0.10	+ 20 0 12.8	2.0
	3162	+ 37 19 54.2						
Mean							+ 20 0 14.8	±0″.15

Latitude of observing station, Kingston, Jamaica, from zenith telescope observations, Mr. M. Rock, observer.

Date.	B. A. C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections.			Latitude.	v.
				Micrometer.	Level and flexure.	Ref.		
1875.		° ′ ″	° ′ ″	′ ″	″	″.	° ′ ″	″
Mar. 1	2097	+ 28 17 39.7	+ 17 58 52.75	− 1 17.93	+ 3.15	− 0.02	+ 17 57 38.0	2.9
	2144	7 40 5.8						
	2144	7 40 5.8	17 59 25.05	1 41.85	− 3.40	0.03	17 57 39.8	1.1
	2178	28 18 44.3						
	2592	33 32 56.6	18 3 9.85	- 5 37.04	+ 5.74	− 0.10	17 57 38.4	2.5
	2653	+ 2 33 23.1						
Mar. 2	1765	− 1 16 50.4	17 57 39.55	+ 0 1.14	1.40	0.00	17 57 42.1	1.1
	1900	+ 37 12 18.5						
	1971	23 8 2.1	17 51 42.0	+ 5 59.43	+ 1.71	+ 0.10	17 57 43.2	2.3
	2012	12 35 21.9						
	2097	28 17 39.7	17 58 52.75	- 1 8.63	− 4.05	− 0.02	17 57 40.0	0.9
	2144	7 40 5.8						
	2359	15 23 13.6	18 1 59.35	4 17.17	− 3.26	0.07	17 57 38.8	2.1
	2423	20 40 45.1						
	2592	33 32 56.6	18 3 9.85	5 32.30	+ 3.09	0.10	17 57 40.5	0.5
	2653	+ 2 33 23.1						
Mar. 3	1765	− 1 16 59.4	17 59 38.0	− 1 52.95	− 5.36	− 0.01	17 57 39.6	1.4
	1844	+ 37 16 15.4						
	1765	− 1 16 59.4	17 57 39.55	+ 0 7.22	4.96	0.00	17 57 41.8	0.8
	1900	+ 37 12 18.5						
	1907	12 47 43.7	17 57 52.9	− 0 9.62	0.50	0.00	17 57 42.8	1.8
	1971	23 8 2.1						
	2097	28 17 39.7	17 58 52.75	1 5.09	5.05	− 0.02	17 57 42.6	1.6
	2144	7 40 5.8						
	2144	7 40 5.8	18 1 15.75	3 32.13	3.26	0.06	17 57 40.3	0.7
	2170	28 22 5.7						
	2144	7 40 5.8	17 59 25.05	1 40.52	3.25	0.03	17 57 41.2	0.2
	2178	28 18 44.3						
	2199	13 21 12.3	18 5 19.85	7 33.39	6.26	0.13	17 57 40.1	0.9
	2313	22 49 27.4						
	2255	13 20 7.9	18 4 47.65	7 1.91	6.06	0.12	17 57 39.6	1.4
	2313	22 49 27.4						
	2359	15 23 13.6	18 1 59.35	− 4 14.96	2.46	− 0.07	17 57 41.9	0.9
	2423	20 40 45.1						
	2676	22 25 13.5	17 56 48.5	+ 0 57.87	2.70	+ 0.02	17 57 43.7	2.7
	2690	+ 13 28 23.5						
Mar. 4	1765	− 1 16 59.4	17 59 38.0	− 1 50.81	5.85	− 0.01	17 57 41.3	0.3
	1844	+ 37 16 15.4						
	1765	− 1 16 59.4	+ 17 37 39.55	+ 0 8.35	− 5.85	0.00	+ 17 57 42.1	1.1
	1900	+ 37 12 18.5						

Latitude of observing station, Kingston, Jamaica.—Continued.

Date.	B. A. C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections. Micrometer	Corrections. Level and flexure.	Corrections. Ref.	Latitudes.	v.
1875.		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	″
Mar. 4	1907	+ 12 47 43.7	+ 17 57 52.9	− 0 6.28	− 3.55	0.00	+ 17 57 43.1	2.1
	1971	23 8 2.1						
	1971	23 8 2.1	17 51 42.0	+ 6 8.78	7.34	+ 0.10	17 57 43.5	2.5
	2012	12 35 21.9						
	2097	28 17 39.7	17 51 32.4	+ 6 16.95	8.64	+ 0.11	17 57 40.8	1.7
	2126	7 25 25.1						
	2097	23 17 39.7	17 58 52.75	− 1 5.09	9.00	− 0.02	17 57 38.6	2.4
	2144	7 40 5.8						
	2144	7 40 5.8	17 59 25.05	− 1 40.25	5.25	− 0.03	17 57 39.5	1.5
	2178	28 18 44.3						
	2359	15 23 13.6	17 56 49.05	+ 1 0.02	7.80	+ 0.02	17 57 41.3	0.3
	2457	20 30 24.5						
	2676	22 25 13.5	17 56 48.5	+ 0 57.61	− 4.45	+ 0.02	17 57 41.7	0.7
	2690	13 28 23.5						
1876.								
Jan. 17	845	9 35 27.4	18 10 15.9	− 12 54.20	+ 21.02	− 0.22	17 57 42.5	1.5
	872	26 45 4.4						
	1023	26 37 28.1	17 57 44.95	0 22.66	19.30	0.00	17 57 41.6	0.6
	1068	9 18 1.8						
	1087	12 30 44.5	18 7 7.05	9 43.47	21.38	− 0.17	17 57 39.8	1.2
	1147	23 43 29.6						
	1087	12 30 44.5	18 7 4.15	9 44.92	21.43	0.16	17 57 40.5	0.5
	1166	23 43 23.8						
	1087	12 30 44.5	18 5 38.2	− 8 19.78	21.43	− 0.14	17 57 39.7	1.3
	1176	23 40 31.9						
	1147	23 43 29.6	17 55 57.5	+ 1 24.14	18.65	+ 0.02	17 57 40.3	0.7
	1241	12 8 25.4						
	1166	23 43 23.8	17 55 54.6	1 27.68	18.70	0.02	17 57 41.0	0.0
	1241	12 8 25.4						
	1176	23 40 31.9	17 54 28.65	+ 2 52.83	18.70	+ 0.05	17 57 40.2	0.8
	1241	12 8 25.4						
	1346	17 15 8.9	18 4 46.4	− 7 28.51	23.34	− 0.13	17 57 41.1	0.1
	1376	18 54 23.9						
	1356	17 9 27.6	18 1 55.75	4 37.49	23.34	0.08	17 57 41.5	0.5
	1376	+ 18 54 23.9						
	1403	− 0 18 38.6	18 5 32.25	− 8 13.49	22.13	− 0.15	17 57 40.7	0.3
	1492	+ 36 29 43.1						
	1520	32 58 17.1	17 50 32.45	+ 6 48.62	22.06	+ 0.12	17 57 43.2	2.2
	1611	+ 2 42 47.8						
	1717	− 1 11 25.5	18 2 24.55	− 5 6.09	21.64	− 0.10	17 57 39.9	1.1
	1844	+ 37 16 14.6						
	1717	− 1 11 25.5	18 0 25.75	3 7.14	21.65	0.06	17 57 40.2	0.8
	1900	+ 37 12 17.0						
	1765	− 1 16 53.0	17 59 40.8	2 20.62	21.70	− 0.04	17 57 41.8	0.8
	1844	+ 37 16 14.6						
	1765	− 1 16 53.0	+ 17 57 41.85	− 0 21.65	+ 21.70	0.00	+ 17 57 41.9	0.9
	1900	+ 37 12 16.7						
Mean							+ 17 57 41.0	±0″.15

Latitude of observing station, Aspinwall, from zenith telescope observations, Mr. M. Rock, observer.

Date.	B. A. C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections. Micrometer.	Level and flexure.	Ref.	Latitude.	v.
1875.		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	″
Jan. 19	921	+ 20 50 27.0	+ 9 35 16.3	—13 5.98	+ 1.54	— 0.23	+ 9 22 11.6	1.0
	994	— 1 39 54.4						
	994	— 1 39 54.4	9 30 57.95	8 46.66	1.45	0.16	9 22 12.6	0.0
	1034	+ 20 41 50.3						
	1052	+ 24 16 56.3	9 23 18.3	1 6.72	1.56	0.02	9 22 12.9	0.3
	1090	— 5 30 19.7						
	1090	— 5 30 19.7	9 28 16.75	6 4.80	1.75	0.10	9 22 12.6	0.0
	1149	+ 24 26 51.2						
	1216	— 3 19 32.3	9 23 47.3	— 1 37.12	1.56	— 0.03	9 22 11.7	0.9
	1221	+ 22 7 6.9						
	1251	5 38 30.7	9 21 15.35	+ 0 55.67	2.52	+ 0.02	9 22 13.6	1.0
	1275	13 4 0.0						
	1285	5 11 48.4	9 27 54.75	— 5 44.53	3.06	— 0.10	9 22 13.2	0.6
	1330	13 44 1.1						
	1365	17 38 31.0	9 22 19.85	0 11.71	2.77	0.00	9 22 10.9	1.7
	1386	+ 1 6 8.7						
	1427	— 3 52 8 7	9 25 27.25	3 15.56	2.47	— 0.05	9 22 14.1	1.5
	1449	+ 22 43 3.2						
	1519	0 15 51.0	9 22 1.46	0 2.37	1.91	0.00	9 22 14.1	1.5
	1568	18 28 38.2						
	1591	15 26 14.5	9 25 47.85	3 37.40	1.06	— 0.06	9 22 11.4	1.2
	1665	3 25 21.2						
	1767	+ 21 3 58.9	9 31 41.1	9 31.01	+ 4.27	0.17	9 22 14.2	1.6
	1794	— 2 0 36.7						
Jan. 20	921	+ 20 50 27.0	9 35 16.3	12 56.70	— 6.47	0.23	9 22 12.9	0.3
	994	— 1 39 54.4						
	994	— 1 39 54.4	9 30 57.95	8 42.91	1.77	0.16	9 22 13.1	0.5
	1034	+ 20 41 50.3						
	1052	+ 24 16 56.3	9 23 18.3	1 4.09	1.36	0.02	9 22 12.8	0.2
	1090	— 5 30 19.7						
	1090	— 5 30 19.7	9 28 15.75	6 1.70	2.32	0.10	9 22 11.6	1.0
	1149	+ 24 26 51.2						
	1216	— 3 19 32.3	9 23 47.3	— 1 32.38	1.86	— 0.03	9 22 13.0	0.4
	1221	+ 22 7 6.9						
	1251	5 38 30.7	9 21 15.35	+ 1 2.58	— 6.00	+ 0.02	9 22 12.0	0.6
	1275	13 4 0.0						
	1285	5 11 48.4	9 27 54.75	— 5 44.33	+ 1.35	— 0.10	9 22 11.7	0.9
	1330	13 44 1.1						
	1365	17 38 31.0	9 22 19.85	0 7.58	— 1.16	0.00	9 22 11.1	1.5
	1386	1 6 8.7						
	1493	18 37 38.0	9 26 44. 5	— 4 28.73	1.37	— 0.08	9 22 14.3	1.7
	1519	0 15 51.0						
	1519	0 15 51.0	9 22 14. 6	+ 0 0.10	0.25	0.00	9 22 14.4	1.8
	1568	18 28 38.2						
	1591	15 26 14.5	9 25 47.85	— 3 36.15	0.81	— 0.06	9 22 10.8	1.8
	1665	3 25 21.2						
	1767	+ 21 3 58.9	9 31 41. 1	9 27.79	0.26	0.17	9 22 12.9	0.3
	1794	— 2 0 36.7						
Jan. 30	1090	— 5 30 20.4	9 28 15.3	5 56.77	5.40	0.10	9 22 13.0	0.4
	1149	+ 24 26 51.0						
	1216	— 3 19 33.1	9 23 46.85	1 27.84	7.21	0.03	9 22 11.8	0.8
	1221	+ 22 7 6.8						
	1285	5 11 47.8	9 27 54.3	5 36.44	6.06	— 0.10	9 22 11.7	0.9
	1330	13 44 0.8						
	1365	17 38 30.4	9 22 19.2	0 3.29	4.33	0.00	9 22 11.6	1.0
	1386	1 6 8.0						
	1493	18 37 37.9	9 26 44.05	— 4 25.57	4.24	— 0.08	9 22 14.2	1.6
	1519	0 15 50.2						
	1519	0 15 50.2	+ 9 22 14.15	+ 0 1.05	— 1.76	0.00	+ 9 22 13.4	0.8
	1568	+ 18 28 38.1						

Latitude of observing station, Aspinwall—Continued.

Date.	B. A. C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections. Micrometer.	Corrections. Level and flexure.	Corrections. Ref.	Latitude.	v.
1875.		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	″
Jan. 30	1591	+ 15 26 14.3	+ 9 25 47.4	— 3 34.51	— 0.96	— 0.06	+ 9 22 11.9	0.7
	1665	3 25 20.5						
	1767	+ 21 3 58.9	9 31 40.6	9 28.51	— 0.51	0.17	9 22 11.4	1.2
	1794	— 2 0 37.7						
Feb. 1	994	— 1 39 55.1	9 30 57.45	8 43.37	+ 0.29	0.16	9 22 14.2	1.6
	1034	+ 20 41 50.0						
	1052	+ 24 16 56.0	9 23 17.8	— 1 7.51	+ 2.37	— 0.02	9 22 12.6	0.0
	1090	— 5 30 20.4						
	1090	— 5 30 20.4	9 17 6.25	+ 5 6.89	— 0.59	+ 0.09	9 22 12.6	0.0
	1151	+ 24 4 32.9						
	1216	— 3 19 33.1	9 23 46.85	— 1 32.65	— 0.96	— 0.03	9 22 13.2	0.6
	1221	+ 22 7 6.8						
	1251	5 38 29.9	9 21 14.8	+ 0 56.59	+ 0.55	+ 0.02	9 22 12.0	0.6
	1275	13 3 59.7						
	1285	5 11 47.8	9 27 54.3	— 5 42.82	+ 2.11	— 0.10	9 22 13.5	0.9
	1330	13 44 0.8						
	1365	17 38 30.4	9 22 19.2	0 3.55	— 2.27	0.00	9 22 13.4	0.8
	1386	1 6 8.0						
	1519	0 15 50.2	9 22 14.15	0 1.32	— 0.71	0.00	9 22 12.1	0.5
	1568	18 28 38.1						
	1591	15 26 14.3	9 25 47.4	3 38.59	+ 2.97	— 0.06	9 22 11.7	0.9
	1665	3 25 20.5						
	1767	+ 21 3 58.9	+ 9 31 40.6	— 9 24.50	— 3.34	— 0.17	+ 9 22 12.6	0.0
	1794	— 2 0 37.7						
	Mean						+ 9 22 12.6	±0″.11

Latitude of observing station, Panama, from zenith telescope observations, Mr. M. Rock, observer.

Date.	B. A. C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections. Micrometer.	Corrections. Level and flexure.	Corrections. Ref.	Latitude.	v.
1874.		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	″
Dec. 27	1068	+ 9 17 48.0	+ 9 7 25.5	+10 16.54	+ 0.10	— 0.18	+ 8 57 8.9	3.2
	1092	+ 8 57 3.0						
	1134	— 5 36 56.5	9 3 9.5	— 6 0.23	0.86	0.11	8 57 10.0	2.3
	1147	+ 23 43 15.5						
	1346	17 14 58.8	8 59 48.9	2 44.68	8.74	0.04	8 57 12.0	0.3
	1431	0 44 39.0						
	1486	6 44 32.7	8 58 55.2	1 45.59	+ 3.95	0.03	8 57 13.5	1.2
	1515	11 13 17.7						
	1557	15 13 49.7	8 58 16.35	1 2.55	— 0.87	0.02	8 57 12.9	0.6
	1611	+ 22 42 43.0						
	1660	— 0 30 22.2	8 59 50.85	— 2 36.93	— 1.21	0.04	8 57 12.7	0.4
	1726	+ 18 30 3.9						
	1792	16 28 7.8	8 56 28.7	+ 0 44.11	+ 1.38	0.01	8 57 14.2	1.9
	1806	1 24 49.6						
Dec. 28	881	14 34 2.4	9 4 59.4	— 7 48.63	— 0.07	— 0.13	8 57 10.6	1.7
	949	+ 3 35 56.4						
	1013	— 9 17 7.6	8 56 13.7	+ 0 54.81	+ 2.00	+ 0.02	8 57 10.5	1.8
	1040	+ 27 9 35.0						
	1057	8 35 19.6	8 56 33.8	+ 0 39.16	— 1.50	+ 0.01	8 57 11.5	0.8
	1068	9 17 48.0						
	1346	17 4 58.8	8 59 48.9	— 2 38.93	+ 0.49	— 0.04	8 57 10.4	1.9
	1431	0 44 39.0						
	1486	6 44 32.7	8 58 55.2	1 42.72	— 0.40	0.03	8 57 12.0	0.3
	1515	11 13 17.7						
	1557	15 13 49.7	+ 8 58 16.35	— 0 56.68	— 6.55	0.02	— 8 57 13.1	0.8
	1611	+ 2 42 43.0						

Latitude of observing station, Panama—Continued.

Date.	B.A.C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections. Micrometer.	Corrections. Level and flexure.	Corrections. Ref.	Latitude.	v.
1874.		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	″
Dec. 28	1660	− 0 30 22.2	+ 8 59 50.85	− 2 40.53	+ 0.41	− 0.04	+ 8 57 10.7	1.6
	1726	+ 18 30 3.9						
	1742	+ 23 57 23.3	8 58 55.75	1 39.32	− 4.70	0.03	8 57 11.7	0.6
	1762	− 5 59 31.8						
Dec. 29	881	+ 14 34 2.4	9 4 59.4	− 7 38.61	5.77	− 0.13	8 57 14.9	2.6
	949	+ 3 35 56.4						
	1013	− 9 17 7.6	8 56 13.7	+ 1 3.76	3.60	+ 0.02	8 57 13.9	1.6
	1040	+ 27 9 35.0						
	1057	8 35 19.6	8 56 33.8	+ 0 40.63	− 2.40	+ 0.01	8 57 11.0	1.3
	1068	9 17 48.0						
	1068	9 17 48.0	9 7 25.5	−10 14.34	+ 0.47	− 0.18	8 57 11.5	0.8
	1092	+ 8 57 3.0						
	1134	− 5 36 56.5	9 3 9.5	6 1.44	4.83	0.11	8 57 12.8	0.5
	1147	+ 23 43 15.5						
	1134	− 5 36 56.5	9 4 23.45	7 16.56	4.73	0.13	8 57 11.5	0.8
	1253	+ 23 45 43.4						
	1346	17 14 58.8	8 59 48.9	2 41.07	+ 5.74	− 0.04	8 57 13.5	1.2
	1431	0 44 39.0						
	1486	6 44 32.7	8 58 55.2	1 40.38	− 4.90	+ 0.03	8 57 10.0	2.3
	1515	11 13 17.7						
	1557	15 13 49.7	8 58 16.35	1 1.35	− 0.55	− 0.02	8 57 14.4	2.1
	1611	+ 2 42 43.0						
	1660	− 0 30 22.2	8 59 30.85	2 43.07	+ 6.09	0.04	8 57 13.8	1.5
	1726	+ 18 30 3.9						
	1742	+ 23 57 23.3	8 58 55.75	− 1 41.39	− 0.10	− 0.03	8 57 14.2	1.9
	1762	− 5 59 31.8						
	1792	+ 16 28 7.8	8 56 28.7	+ 0 50.73	− 6.35	+ 0.01	8 57 13.1	0.8
	1806	+ 1 24 49.6						
Dec. 30	1013	− 9 17 7.6	8 56 13.7	+ 1 0.28	+ 0.90	+ 0.02	8 57 14.9	2.6
	1040	+ 27 9 35.0						
	1346	17 14 58.8	8 59 48.9	− 2 36.66	− 1.11	− 0.04	8 57 11.1	1.2
	1431	0 44 39.0						
	1486	6 44 32.7	8 58 55.2	1 43.06	+ 0.15	0.03	8 57 12.3	0.0
	1515	11 13 17.7						
	1557	15 13 49.7	8 58 16.35	1 4.96	2.20	0.02	8 57 13.6	1.3
	1611	2 42 43.0						
	1742	+ 23 57 23.3	8 58 55.75	− 1 49 80	4.10	− 0.03	8 57 10.0	2.3
	1762	− 5 59 31.8						
	1792	+ 16 28 7.8	8 56 28.7	+ 0 42.04	+ 3.20	+ 0.01	8 57 14.0	1.7
	1806	1 24 49.6						
Dec. 31	881	14 34 2.4	9 4 59.4	− 7 46.43	− 1.07	− 0.13	8 57 11.8	0.5
	949	+ 3 35 56.4						
	1013	− 9 17 7.6	8 56 13.7	+ 1 8.03	7.30	+ 0.02	8 57 14.4	2.1
	1040	+ 27 9 35.0						
	1057	8 35 19.6	8 56 33.8	+ 0 41.50	5.30	+ 0.01	8 57 10.0	2.3
	1068	9 17 48.0						
	1557	15 13 49.7	8 58 16.35	− 1 3.29	− 2.52	− 0.02	8 57 10.5	1.8
	1611	+ 2 42 43.0						
	1660	− 0 30 22.2	8 59 50.85	2 39.87	+ 2.99	0.04	8 57 13.9	1.6
	1726	+ 18 30 3.9						
	1742	+ 23 57 23.3	8 58 55.75	− 1 40.85	− 2.00	− 0.03	8 57 12.9	0.6
	1762	− 5 59 31.8						
	1792	+ 16 28 7.8	+ 8 56 28.7	+ 0 45.51	− 1.75	+ 0.01	+ 8 57 12.5	0.2
	1806	+ 1 24 49.6						
Mean							+ 8 57 12.3	±0″.18

Latitude of observing station, San Juan, Porto Rico, from zenith telescope observations, Lieut. Commander F. M Green, U. S. N., observer.

Date.	B. A. C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections. Micrometer	Level and flexure.	Ref.	Latitude.	v.
1876.		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	
May 16	4729	+ 19 49 24.5	+ 18 23 6.75	+ 5 34.79	— 5.74	+ 0.09	+18 28 35.9	0.5
	4847	16 56 49.0						
	4847	16 56 49.0	18 16 45.7	12 3.93	13.59	0.20	18 28 36.2	0.2
	4905	19 36 42.4						
	5031	29 37 17.7	18 12 59.95	15 42.68	4.58	0.28	18 28 38.3	1.9
	5196	6 48 42.2						
	5098	29 31 48.3	18 10 15.25	+ 18 26.69	5.58	+ 0.33	18 28 36.7	0.3
	5196	6 48 42.2						
	5216	15 48 24.2	18 35 7.85	— 5 54.73	— 5.39	— 0.10	+18 28 34.7	1.7
	5252	+ 21 21 51.5						
Mean							+18 28 36.36	±0″.39

Latitude of observing station, St. Thomas, West Indies, from zenith telescope observations, Mr. M. Rock, observer.

Date.	B. A. C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections. Micrometer.	Level and flexure.	Ref.	Latitude.	v.
1876.		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	″
Feb. 8	2617	+ 27 5 11.0	+ 18 19 34.95	+ 0 46.65	+ 1.65	+ 0.01	+ 18 20 22.3	0.4
	2778	9 33 58.9						
	2778	9 33 58.9	18 27 10.5	— 6 49.82	— 0.46	— 0.12	18 20 20.1	1.8
	2817	27 20 22.1						
	2911	3 46 30.7	18 21 23.0	— 1 0.35	+ 0.25	— 0.02	18 20 22.9	1.0
	2999	32 56 15.3						
	2911	3 46 30.7	18 20 13.7	+ 0 9.16	0.30	0.00	18 20 23.2	1.3
	3056	32 53 56.7						
	2945	3 50 31.5	18 23 23.4	— 3 4.46	0.25	— 0.05	18 20 19.1	2.8
	2999	32 56 15.3						
	2945	3 50 31.5	18 22 14.1	— 1 54.95	0.30	— 0.03	18 20 19.4	2.5
	3056	32 53 56.7						
	2945	3 50 31.5	18 17 20.5	+ 3 3.72	0.20	+ 0.05	18 20 24.5	2.6
	3068	32 44 9.5						
	3146	2 50 8.0	18 31 1.95	— 10 41.87	0.98	— 0.19	18 20 20.9	1.0
	3238	34 11 55.9						
	3331	24 20 36.4	18 27 26.8	— 7 8.40	+ 0.84	— 0.12	18 20 19.1	2.8
	3459	12 34 17.2						
	3459	12 34 17.2	18 18 7.95	+ 2 16.28	— 0.85	+ 0.03	18 20 23.4	1.5
	3508	24 1 58.7						
Feb. 9	2617	27 5 11.0	18 19 34.95	+ 0 46.38	— 0.05	+ 0.01	18 20 21.3	0.6
	2778	9 33 58.9						
	2778	9 33 58.9	18 27 10.5	— 6 51.29	+ 1.04	— 0.12	18 20 20.1	1.8
	2817	27 20 22.1						
	2911	3 46 30.7	18 21 23.0	— 1 0.88	2.40	— 0.02	18 20 24.5	2.6
	2999	32 56 15.3						
	2911	3 46 30.7	18 20 13.7	+ 0 7.48	2.40	0.00	18 20 23.6	1.7
	3056	32 53 56.7						
	2945	3 50 31.5	18 23 23.4	— 3 5.47	2.35	— 0.05	18 20 20.2	1.7
	2999	32 56 15.3						
	2945	3 50 31.5	18 22 14.1	— 1 57.09	2.35	— 0.03	18 20 19.3	2.6
	3056	32 53 56.7						
	2945	3 50 31.5	18 17 20.5	+ 3 1.45	2.45	+ 0.03	18 20 24.4	2.5
	3068	32 44 9.5						
	3146	2 50 8.0	18 31 1.95	— 10 43.20	+ 3.38	— 0.19	18 20 21.9	0.0
	3238	34 11 55.9						
	3261	+ 36 56 46.8	+ 18 10 55.9	+ 9 27.29	— 1.03	+ 0.18	+ 18 20 22.3	0.4
	3303	— 0 34 55.0						

Latitude of observing station, St. Thomas, West Indies—Continued.

Date.	B. A. C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections. Micrometer.	Corrections. Level and flexure.	Corrections. Ref.	Latitude.	v.
1876.		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	″
Feb. 9	3331	+ 24 20 36.4	+ 18 27 26.8	— 7 6.26	+ 0.94	— 0.12	+ 18 20 21.4	0.5
	3459	12 34 17.2						
	3459	12 34 17.2	18 18 7.95	+ 2 16.88	0.00	+ 0.03	18 20 24.9	3.0
	3508	24 1 58.7						
	3609	9 56 32.9	18 27 28.9	— 7 11.40	+ 2.44	— 0.12	18 20 19.8	2.1
	3666	26 58 24.9						
Feb. 10	2617	27 5 11.0	18 19 34.95	+ 0 49.18	— 1.80	+ 0.01	18 20 22.3	0.4
	2778	9 33 58.9						
	2778	9 33 58.9	18 27 10.5	— 6 52.23	+ 0.89	— 0.12	18 20 19.0	2.9
	2817	27 20 22.1						
	2911	3 46 30.7	18 21 23.0	— 0 59.88	— 0.25	— 0.02	18 20 22.8	0.9
	2999	32 56 15.3						
	2911	3 46 30.7	18 20 13.7	+ 0 9.89	— 0.10	0.00	18 20 23.5	1.6
	3056	32 53 56.7						
	2945	3 50 31.5	18 23 23.4	— 3 4.39	+ 0.35	— 0.05	18 20 19.3	2.6
	2999	32 56 15.3						
	2945	3 50 31.5	18 22 14.1	— 1 54.68	0.50	— 0.03	18 20 19.9	2.0
	3056	32 53 56.7						
	2945	3 50 31.5	18 17 20.5	+ 3 2.52	0.60	+ 0.05	18 20 23.7	1.8
	3068	32 44 9.5						
	3146	2 50 8.0	18 31 1.95	— 10 41.33	+ 2.98	— 0.19	18 20 23.4	1.5
	3238	34 11 55.9						
	3261	+ 36 56 46.8	18 10 55.9	+ 9 29.16	— 1.28	+ 0.18	18 20 24.0	2.1
	3303	— 0 34 55.0						
	3331	+ 24 20 36.4	18 27 26.8	— 7 4.39	+ 2.29	— 0.12	18 20 24.6	2.7
	3459	12 34 17.2						
	3459	12 34 17.2	18 18 7.95	+ 2 16.08	0.15	+ 0.03	18 20 24.2	2.3
	3506	24 1 58.7						
	3609	9 56 32.9	18 27 28.9	— 7 11.81	2.55	— 0.12	18 20 19.5	2.4
	3666	+ 26 58 24.9						
Feb. 11	1730	— 0 23 30.7	18 24 24.0	4 4.47	0.59	0.08	18 20 20.0	1.9
	1900	+ 37 12 18.7						
	1958	14 46 59.2	18 39 47.1	19 28.86	3.86	0.33	18 20 21.8	0.1
	2002	22 32 35.0						
	1958	14 46 59.2	18 40 49.5	20 30.93	4.10	0.35	18 20 22.3	0.4
	2047	22 34 39.8						
	1990	14 14 11.6	18 23 23.3	3 4.19	3.15	0.05	18 20 22.2	0.3
	2002	22 32 35.0						
	1990	14 14 11.6	18 24 25.7	— 4 6.34	3.39	— 0.07	18 20 22.7	0.8
	2047	22 34 39.8						
	2222	2 32 48.1	18 19 44.4	+ 0 31.62	6.70	+ 0.01	18 22 22.7	0.8
	2237	34 6 40.7						
	2442	28 2 40.1	18 17 28.8	+ 2 49.63	0.50	+ 0.05	18 20 19.0	2.9
	2462	8 32 17.5						
	2462	8 32 17.5	18 25 54.9	— 5 36.04	0.69	— 0.10	18 20 19.4	2.5
	2555	28 19 32.3						
	3459	12 34 17.2	18 18 7.95	+ 2 5.24	+ 9.25	+ 0.03	18 20 22.7	0.8
	3508	24 1 58.7						
Feb. 22	1958	14 46 59.1	18 39 47.15	— 19 25.84	— 0.89	— 0.33	18 20 20.1	1.8
	2002	22 32 35.2						
	1958	14 46 59.1	18 40 49.55	20 27.73	— 0.55	0.35	18 20 20.9	1.0
	2047	22 34 40.0						
	1990	14 14 11.6	18 23 23.4	3 0.85	+ 0.10	0.05	18 20 22.6	0.7
	2002	22 32 35.2						
	1990	14 14 11.6	18 24 25.8	— 4 2.80	0.44	— 0.07	18 20 23.4	1.5
	2047	22 34 40.0						
	2222	2 32 47.4	18 19 44.45	+ 0 35.29	2.85	+ 0.01	18 20 22.6	0.7
	2237	34 6 41.5						
	2462	8 32 17.1	+ 18 25 55.05	— 5 34.17	+ 1.44	— 0.10	+ 18 20 22.2	0.3
	2555	+ 28 19 33.0						

Latitude of observing station, St. Thomas, West Indies—Continued.

Date.	B. A. C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections. Micrometer.	Level and flexure.	Ref.	Latitude.	v.
1876.		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	″
Feb. 22	2617	+ 27 5 11.7	+ 18 19 35.1	+ 0 48.52	— 0.90	+ 0.01	+ 18 20 22.7	0.8
	2778	9 33 58.5						
	2778	9 33 58.5	18 27 10.7	— 6 53.64	+ 2.34	— 0.12	18 20 19.3	2.6
	2817	27 20 22.9						
	2911	3 46 29.8	18 21 23.1	— 1 0.62	0.55	— 0.02	18 20 23.0	1.1
	2999	32 56 16.4						
	2911	3 46 29.8	18 20 13.8	+ 0 8.89	1.50	0.00	18 20 24.2	2.3
	3056	32 53 57.8						
	2945	3 50 30.7	18 17 20.1	+ 3 1.59	1.50	+ 0.05	18 20 23.2	1.3
	3008	32 44 9.5						
	3146	2 50 7.0	18 31 2.05	— 10 43.14	4.33	— 0.19	18 20 23.0	1.1
	3238	34 11 57.1						
	3331	24 20 36.9	18 27 26.8	— 7 11.67	5.28	— 0.12	18 20 20.3	1.6
	3459	12 34 16.7						
	3459	12 34 16.7	18 18 7.95	+ 2 14.47	0.50	+ 0.03	18 20 23.0	1.1
	3508	24 1 59.2						
	3609	9 56 32.3	+ 18 27 29.9	— 7 12.54	+ 3.43	— 0.12	+ 18 20 20.7	1.2
	3666	+ 26 58 27.5						
Mean							+ 18 20 21.9	±0″.16

Latitude of observing station, Christianstadt, Santa Cruz, from zenith telescope observations, Mr. M. Rock, observer.

Date.	B. A. C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections. Micrometer.	Level and flexure.	Ref.	Latitude.	v.
1876.		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	″
May 5	3371	+ 26 35 27.4	+ 17 36 50.55	+ 8 12.69	+ 5.32	+ 0.14	+ 17 45 8.7	1.1
	3415	8 38 13.7						
	3508	24 2 5.1	17 37 1.85	8 2.67	2.07	0.14	17 45 6.7	0.9
	3708	11 11 58.6						
	3671	23 50 12.1	17 31 5.35	+ 13 59.03	2.08	+ 0.24	17 45 6.7	0.9
	3708	11 11 58.6						
	3851	32 13 35.0	17 52 53.0	— 7 46.36	+ 0.83	— 0.14	17 45 7.3	0.3
	3900	3 32 11.0						
May 6	3371	26 35 27.4	17 36 50.55	+ 8 20.05	— 2.18	+ 0.14	17 45 8.6	1.0
	3415	8 38 13.7						
	3508	24 2 5.1	17 37 1.85	8 11.62	4.23	0.14	17 45 9.4	1.8
	3708	11 11 58.6						
	3671	23 50 12.1	17 31 5.35	+ 14 4.91	4.37	+ 0.24	17 45 6.1	1.5
	3708	11 11 58.6						
	3851	32 13 35.0	17 52 53.0	— 7 43.82	1.77	— 0.14	17 45 7.3	0.3
	3900	3 32 11.0						
May 7	3371	26 35 27.4	17 36 50.55	+ 8 20.92	3.03	+ 0.14	17 45 8.6	1.0
	3415	8 38 13.7						
	3508	24 2 5.1	17 37 1.85	8 5.67	1.43	0.14	17 45 6.2	1.4
	3708	11 11 58.6						
	3671	23 50 12.1	17 31 5.35	+ 14 6.11	2.67	+ 0.24	17 45 9.0	1.4
	3708	11 11 58.6						
	3851	32 13 35.0	+ 17 52 53.0	— 7 41.82	— 3.92	— 0.14	+ 17 45 7.1	0.5
	3900	+ 3 32 11.0						
Mean							+ 17 45 7.64	±0″.22

Latitude of observing station, St. Pierre, Martinique, from zenith telescope observations, Lieut. J. A. Norris, U. S. N., observer.

Date.	B. A. C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections. Micrometer.	Corrections. Level and flexure.	Corrections. Ref.	Latitude.	v.
1876.		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	″
April 1	2987	— 2 59 7.5	+ 14 58 36.4	— 14 43.92	+ 3.23	— 0.28	+ 14 43 55.4	1.1
	2999	+ 32 56 20.3						
	2987	— 2 59 7.5	14 57 27.15	13 33.90	2.72	0.26	14 43 55.7	1.4
	3056	+ 32 54 1.8						
	2987	— 2 59 7.5	14 52 27.25	— 8 37.84	+ 2.73	— 0.16	14 43 52.0	2.3
	3068	+ 32 44 2.0						
	3079	24 56 21.5	14 39 22.35	+ 4 31.23	0.37	+ 0.08	14 43 53.3	1.0
	3133	4 22 23.2						
	3133	4 22 23.2	14 47 59.15	— 4 3.20	+ 0.11	— 0.07	14 43 56.0	1.7
	3285	25 13 35.1						
	3522	20 5 54.1	14 45 18.95	1 17.12	— 6.38	0.02	14 43 55.4	1.1
	3561	+ 9 24 43.8						
April 2	2814	— 3 21 4.1	14 47 38.1	3 39.12	2.51	0.07	14 43 56.4	2.1
	2999	+ 32 56 20.3						
	2987	— 2 59 7.5	14 58 36.4	14 39.36	2.65	0.28	14 43 54.1	0.2
	2999	+ 32 56 20.3						
	3133	4 22 23.2	14 47 59.15	— 4 4.38	2.39	— 0.07	14 43 52.3	2.0
	3285	25 13 35.1						
	3962	7 13 15.3	14 41 31.95	+ 2 59.11	4.37	+ 0.05	14 43 53.8	0.5
	4066	22 9 48.6						
	4052	7 18 7.7	+ 14 43 58.15	+ 0 32.24	— 4.75	+ 0.01	+ 14 43 52.7	1.6
	4066	+ 22 9 48.6						
	Mean						+ 14 43 54.3	±0″.32

Latitude of observing station, Bridgetown, Barbados, from zenith telescope observations, Lieut. J. A. Norris, U. S. N., observer.

Date.	B. A. C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections. Micrometer.	Corrections. Level and flexure.	Corrections. Ref.	Latitude.	v.
1876.		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	″
Mar. 16	3204	+ 26 42 54.2	+ 13 3 58.1	+ 1 43.11	+ 0.38	+ 0.03	+ 13 5 41.6	0.6
	3303	— 0 34 58.0						
	3606	+ 14 46 14.9	12 59 5.55	6 32.70	+ 4.90	0.11	13 5 43.3	1.1
	3708	11 11 56.2						
	3693	14 50 47.0	13 1 21.6	4 22.68	— 0.89	0.08	13 5 43.5	1.3
	3708	11 11 56.2						
	3742	25 24 32.3	13 0 19.45	5 24.79	0.37	0.10	13 5 44.0	1.8
	3832	0 36 6.6						
	3809	25 19 37.4	12 57 52.0	+ 7 52.18	— 0.48	+ 0.14	13 5 43.8	1.6
	3832	0 36 6.6						
	3842	23 46 7.1	13 13 43.15	— 8 5.28	+ 1.86	— 0.14	13 5 39.6	2.6
	3850	2 41 19.2						
	3877	11 12 33.0	13 7 50.15	— 2 6.54	— 4.12	— 0.04	13 5 39.4	2.8
	3919	15 3 7.3						
Mar. 17	3204	+ 26 42 54.2	13 3 58.1	+ 1 38.31	+ 4.88	+ 0.03	13 5 41.3	0.9
	3303	— 0 34 58.0						
	3606	+ 14 46 14.9	12 59 5.55	6 45.35	— 7.73	0.11	13 5 43.3	1.1
	3708	11 11 56.2						
	3693	14 50 47.0	13 1 21.6	4 31.69	9.49	0.08	13 5 43.9	1.7
	3708	11 11 56.2						
	3742	25 24 32.3	13 0 19.45	5 24.00	— 0.74	0.10	13 5 42.8	0.6
	3832	0 36 6.6						
	3809	25 19 37.4	12 57 52.0	+ 7 50.61	+ 0.02	+ 0.14	13 5 42.8	0.6
	3832	0 36 6.6						
	3877	11 12 33.0	+ 13 7 50.15	— 1 58.84	— 12.00	— 0.03	+ 13 5 39.3	2.9
	3919	+ 15 3 7.3						
	Mean						13 5 42.2	±0″.33

Latitude of observing station, Port of Spain, Trinidad, from zenith telescope observations, Mr. M. Rock, observer.

Date.	B. A. C. No. of star.	Apparent declination.	Half sum of declinations.	Corrections.			Latitude.	n.
				Micrometer.	Level and flexure.	Ref.		
1876.		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	″
Mar. 10	3406	+ 13 2 2.4	+ 10 50 7.3	−11 26.24	− 4.72	− 0.20	+ 10 38 36.1	2.9
	3415	8 38 12.2						
	3415	8 38 12.2	10 36 14.45	+ 2 26.50	2.10	+ 0.04	10 38 38.9	0.1
	3459	12 34 16.7						
Mar. 15	2486	16 5 34.5	10 49 1.5	−10 14.47	6.32	− 0.17	10 38 40.5	1.5
	2522	5 32 28.5						
	2789	+ 24 24 43.1	10 27 13.6	+11 32.32	6.83	+ 0.21	10 38 39.3	0.3
	2825	− 3 30 15.9						
	3146	+ 2 50 5.9	10 31 56.1	+ 6 48.88	8.84	+ 0.11	10 38 36.2	2.8
	3171	18 13 46.3						
	3406	13 2 2.6	10 50 7.35	−11 21.56	7.37	− 0.20	10 38 38.2	0.8
	3415	8 38 12.1						
	3415	8 38 12.1	10 36 14.45	+ 2 30.71	4.75	+ 0.04	10 38 40.4	1.4
	3459	12 34 16.8						
	3609	9 56 32.0	10 34 14.1	4 32.01	5.19	0.08	10 38 41.0	2.0
	3708	11 11 56.2						
	3776	+ 20 50 32.9	10 21 0.5	+17 46.93	8.61	+ 0.31	10 38 39.1	0.1
	3946	− 0 8 31.9						
Mar. 16	2486	+ 16 5 34.5	10 49 1.5	−10 21.62	0.97	− 0.17	10 38 38.7	0.3
	2522	5 32 28.5						
	2789	+ 24 24 43.1	10 27 13.6	+11 29.58	4.67	+ 0.21	10 38 38.8	0.2
	2825	− 3 30 15.9						
	2853	+ 18 30 44.9	10 40 25.4	− 1 41.99	1.75	− 0.03	10 38 41.6	2.6
	3146	2 50 5.9						
	2953	18 36 31.9	10 43 18.9	− 4 35.42	1.71	− 0.08	10 38 41.7	2.7
	3146	2 50 5.9						
	3146	2 50 5.9	10 31 56.1	+ 6 46.41	4.68	+ 0.11	10 38 37.9	1.1
	3171	18 13 46.3						
	3227	9 35 40.4	10 43 14.75	− 4 34.88	2.31	− 0.08	10 38 37.6	1.4
	3250	11 50 49.1						
	3406	13 2 2.6	10 50 7.35	−11 24.44	5.67	− 0.20	10 38 37.0	2.0
	3415	8 38 12.1						
	3415	8 38 12.1	10 36 14.45	+ 2 27.30	2.50	+ 0.04	10 38 39.3	0.3
	3459	12 34 16.8						
	3508	+ 24 2 0.7	10 30 26.25	8 17.63	3.78	0.15	10 38 40.2	1.2
	3553	− 3 1 8.2						
	3776	+ 20 50 32.9	10 21 0.5	17 45.92	7.11	0.31	10 38 39.6	0.6
	3946	− 0 8 31.9						
	3834	+ 21 12 2.4	10 31 45.25	+ 7 1.18	7.09	+ 0.11	10 38 39.4	0.4
	3946	− 0 8 31.9						
Mar. 17	2486	+ 16 5 34.5	10 49 1.5	−10 16.07	3.47	− 0.17	10 38 41.8	2.8
	2522	5 32 28.5						
	2551	+ 24 41 43.5	10 40 18.85	− 1 32.76	7.50	− 0.03	10 38 38.6	0.4
	2814	− 3 21 5.8						
	2551	+ 24 41 43.5	10 35 43.8	+ 3 3.39	7.50	+ 0.05	10 38 39.7	0.7
	2825	− 3 30 15.9						
	3146	+ 2 50 5.9	10 31 56.1	+ 6 45.48	5.58	+ 0.11	10 38 36.1	2.9
	3171	18 13 46.3						
	3406	13 2 2.6	10 50 7.35	−11 22.23	7.22	− 0.20	10 38 37.7	1.3
	3415	8 38 12.1						
	3415	8 38 12.1	10 36 14.45	+ 2 27.64	2.25	+ 0.04	10 38 39.9	0.9
	3459	12 34 16.8						
	3834	+ 21 12 2.4	10 31 45.25	+ 6 58.11	5.35	+ 0.11	10 38 38.1	0.9
	3946	− 0 8 31.9						
	2486	+ 16 5 34.5	10 49 1.5	−10 19.68	2.47	− 0.17	10 38 39.2	0.2
	2522	5 32 28.5						
	2551	+ 24 41 43.5	+ 10 40 18.85	− 1 32.89	− 7.10	− 0.03	+ 10 38 38.8	0.2
	2814	− 3 21 5.8						

Latitude of observing station, Port of Spain, Trinidad, &c.—Continued.

Date.	B. A. C. No. of Star.	Apparent declination.	Half sum of declinations.	Corrections. Micrometer.	Corrections. Level and flexure.	Corrections. Ref.	Latitude.	v.
		° ′ ″	° ′ ″	′ ″	″	″	° ′ ″	″
1876. Mar. 17	2789	+ 24 24 43.1	+ 10 27 13.6	+11 28.78	— 3.03	+ 0.21	+ 10 38 39.6	0.6
	2825	— 3 30 15.9						
	2853	+ 18 30 44.9	10 40 25.4	— 1 46.93	2.15	— 0.03	10 38 36.3	2.7
	3146	2 50 5.9						
	3406	13 2 2.6	10 50 7.35	—11 21.03	7.87	— 0.20	10 38 38.2	0.8
	3415	8 38 12.1						
	3415	8 38 12.1	+ 10 36 14.45	+ 2 30.31	— 3.90	+ 0.04	+ 10 38 40.9	1.9
	3459	+ 12 34 16.8						
Mean							+ 10 38 39.0	±0″.28

RECAPITULATION OF RESULTS.

HAVANA.

The latitude of the Havana station, as determined by Don Cecilio Pujazon, is N. 23° 8′ 3″.04.

Telegraphic difference of longitude between the Key West and Havana stations		2m 11s.480
Correction for personal equation, Mr. Rock being east of Lieut. Commander Green	+	0s.025
Corrected difference of longitude	+	2m 11s.505
Longitude of Key West station, United States Coast Survey Report, 1875, Appendix 11		5h 27m 13s.644
Longitude of Havana station		5h 29m 25s.149

As the Morro light-house bears N. 8° 39′ W., 7,956 feet from the observing station, a correction of + 1′ 17″.94 of latitude and + 0s.854 of longitude must be applied to reduce the position of the station to that of the light-house. Applying these corrections the result is—

Morro light-house, { Lat., N. 23° 9′ 20″.98 / Lon., W. 5h 29m 26s.00 / Or in arc, 82° 21′ 30″.0

SANTIAGO DE CUBA.

The latitude of the Santiago station, as determined from thirty-four observations of pairs of stars, is N. 20° 0′ 14″.8.

Telegraphic difference of longitude between the Havana and Santiago stations		26 3s.218
Correction for personal equation, Mr. Rock being east of Lieut. Commander Green	+	0s.025
Corrected difference of longitude	—	26m 3s.243
Longitude of Havana station		5h 29m 25s.149
Longitude of Santiago station		5h 3m 21s.906

The southern angle of the Blanca battery bears from the observing station N. 39° W., distant 203 feet. To reduce the position of the station to that of the battery a correction to the latitude of + 1″.6 and to the longitude of + 0s.10 is required. Applying these corrections the result is—

Blanca battery (south angle), { Lat., N. 20° 0′ 16″.4 / Lon., W. 5h 3m 22s.01 / Or in arc, 75° 50′ 30″.15

KINGSTON.

The latitude of the Kingston station, as determined from forty-three observations of pairs of stars, is N. 17° 57′ 40″.98.

Telegraphic difference of longitude between the Santiago and Kingston stations		$3^m\ 48^s.765$
Correction for personal equation, Mr. Rock being west of Lieut. Commander Green	—	$0^s.025$
	+	$3^m\ 48^s.740$
Longitude of the Santiago station		$5^h\ 3^m\ 21^s.906$
Longitude of the Kingston station		$5^h\ 7^m\ 10^s.646$

From the Kingston station (Lord Rodney's statue) the Port Royal flag-staff (Fort Charles) bears S. 58° 20′ W., distant 20,204 feet. To reduce the position of the station to that of the flag-staff a correction to the latitude of — 1′ 45″.16 and to the longitude of + 11ˢ.87 is required. Applying these corrections the result is—

Port Royal flag-staff, { Lat., N. 17° 55′ 55″.8 / Lon., W. $5^h\ 7^m\ 22^s.52$ / Or in arc, 76° 50′ 37″.8

ASPINWALL.

The latitude of the Aspinwall station, as determined by forty-two observations of pairs of stars, is N. 9° 22′ 12″.6.

Telegraphic difference of longitude between the Aspinwall and Kingston stations		$12^m\ 27^s.918$
Correction for personal equation, Mr. Rock being west of Lieut. Commander Green	—	$0^s.025$
Corrected difference of longitude	+	$12^m\ 27^s.893$
Longitude of Kingston station		$5^h\ 7^m\ 10^s.646$
Longitude of Aspinwall station		$5^h\ 19^m\ 38^s.539$

From the Aspinwall station the light-house bears S. 59° 30′ W., distant 756 feet. To reduce the position of the station to that of the light-house, a correction to the latitude of — 3″.8 and to the longitude of + 0ˢ.43 is required. Applying these corrections the result is—

Aspinwall light-house, { Lat., N. 9° 22′ 8″.8 / Lon., W. $5^h\ 19^m\ 38^s.98$ / Or in arc, 79° 54′ 44″.7

PANAMA.

The latitude of the Panama station, as determined from forty observations of pairs of stars, is N. 8° 57′ 12″.3.

Telegraphic difference of longitude between the Aspinwall and Panama stations		$1^m\ 30^s.205$
Correction for personal equation, Mr. Rock being east of Lieut. Commander Green	+	$0^s.025$
Corrected difference of longitude	—	$1^m\ 30^s.230$
Longitude of Aspinwall station		$5^h\ 19^m\ 38^s.539$
Longitude of Panama station		$5^h\ 18^m\ 8^s.309$

From the Panama station the southeast angle of the southern tower of the cathedral bears S. 51° 10′ W., distant 988 feet.

To reduce the position of the station to that of the cathedral a correction of the latitude of — 6″.15 and to the longitude of + 0ˢ.51 is required. Applying these corrections the result is—

Panama cathedral, southeast angle of south tower, { Lat., N. 8° 57′ 6″.15 / Lon., W. $5^h\ 18^m\ 8^s.82$ / Or in arc, 79° 32′ 12″.3 }

SAN JUAN DE PUERTO RICO.

The latitude of the San Juan station, as determined from five observations of pairs of stars, is N. 18° 28′ 36″.36.

Telegraphic difference of latitude between the San Juan and St. Thomas stations		$4^m\ 45^s.345$
Correction for personal equation, Mr. Rock being east of Lieut. Commander Green	+	$0^s.025$
Corrected difference of longitude	+	$4^m\ 45^s.370$
Longitude of St. Thomas station		$4^h\ 19^m\ 43^s.501$
Longitude of San Juan station		$4^h\ 24^m\ 28^s.871$

From the observatory at San Juan the new light-house on the Morro bore N. 35° 55′ 45″ W., distant 2,428.2 feet. To reduce the position of the observatory to that of the light-house a correction to the latitude of + 19″.50 and to the longitude of + 0ˢ.98 is required. Applying these corrections the result is—

Morro light-house, { Lat., N. 18° 28′ 55″.86 / Lon., W. $4^h\ 24^m\ 29^s.85$ / Or in arc, 66° 7′ 27″.75 }

ST. THOMAS.

The latitude of the St. Thomas station, as determined from fifty-eight observations of pairs of stars, is 18° 20′ 21″.9.

Telegraphic difference of longitude between the Kingston and St. Thomas stations	$47^m\ 27^s.160$
Correction for personal equation, Mr. Rock being west of Lieut. Commander Green	$-\ 0^s.025$
Corrected difference of longitude	$-47^m\ 27^s.135$
Longitude of Kingston station	$5^h\ 7^m\ 10^s.646$
Longitude of St. Thomas station	$4^h\ 19^m\ 43^s.501$

The southwest angle of Fort Christian bearing north 126 feet from the observing station, a correction of + 1″.25 to the latitude and 0ˢ.0 to the longitude is required to reduce the position of the observatory to that of the fort. Applying this correction the result is—

Southwest angle of Fort Christian, { Lat., N. 18° 20′ 23″.15 / Lon., W. $4^h\ 19^m\ 43^s.50$ / Or in arc, 64° 55′ 52″.5

ST. CROIX.

The latitude of the St. Croix station, as determined from twelve observations of pairs of stars, is N. 17° 45′ 7″.6.

Telegraphic difference of longitude, as measured with Lieut. Commander Green at St. Thomas and Mr. M. Rock at St. Croix	$54^s.42$
With Lieut. Commander Green at St. Croix and Mr. Rock at St. Thomas	$54^s.47$
Mean of the two measurements, the personal equation being eliminated	$-\ 54^s.445$
Longitude of the St. Thomas station	$4^h\ 19^m\ 43^s.501$
Longitude of St. Croix station	$4^h\ 18^m\ 49^s.056$

From the St. Croix station the transit-pier of Maj. A. Lang's observatory bore S. 66° 10′ 34″ E., distant 6,220.7 feet. To reduce the position to that of Lang's observatory, a correction of — 24″.9 to the latitude and — 3ˢ.89 to the longitude is required. Applying these corrections the result is—

Lang's observatory, (center of transit-pier), { Lat., N. 17° 44′ 42″.7 / Lon., W. $4^h\ 18^m\ 45^s.17$ / Or in arc, 64° 41′ 17″.4

ST. JOHN (ANTIGUA).

The latitude of the St. John station was not determined.

The telegraphic difference of longitude between the St. John and St. Thomas stations	$12^m\ 20^s.990$
Correction for personal equation, Mr. Rock being west of Lieut. Commander Green	$-\ 0^s.025$
Corrected difference of longitude	$-\ 12^m\ 20^s.965$
Longitude of St. Thomas station	$4^h\ 19^m\ 43^s.501$
Longitude of St. John station	$4^h\ 7^m\ 22^s.536$

From the station the north tower of the cathedral bore N. 37° E., distant 1,643 feet. To reduce the longitude of the observatory to that of the cathedral a correction of $-0^s.68$ is required. Applying this correction the result is—

North tower of cathedral, { Lon., W. $4^h\ 7^m\ 21^s.86$
Or in arc, 61° 50′ 27″.9

ST. PIERRE, MARTINIQUE.

The latitude of the St. Pierre station, as determined from eleven observations of pairs of stars, is N. 14° 43′ 54″.28.

Telegraphic difference of longitude between the Port Spain and St. Pierre stations	$1^m\ 17^s.933$
Correction for personal equation, Mr. Rock being west of Lieut. Commander Green	$-\ 0^s.025$
Corrected difference of longitude	$-\ 1^m\ 17^s.908$
Longitude of Port Spain station	$4^h\ 6^m\ 2^s.686$
Longitude of St. Pierre station	$4^h\ 4^m\ 44^s.778$

The observatory being 35 feet north of the mast on which the upper light of St. Marthe battery is hoisted, a correction of $-0''.35$ to the latitude and $0^s.0$ to the longitude is required to reduce the position of the observatory to that of this mast. Applying this correction the result is—

St. Marthe battery, upper light, { Lat., N. 14° 43′ 53″.9
Lon., W. $4^h\ 4^m\ 44^s.78$
Or in arc, 61° 11′ 11″.7

BRIDGETOWN (BARBADOS).

The latitude of the Bridgetown station, as determined from thirteen observations of pairs of stars, is 13° 5′ 42″.2.

Telegraphic difference of longitude between the Bridgetown and Port Spain stations	$7^m\ 33^s.518$
Correction for personal equation, Mr. Rock being west of Lieut. Commander Green	— $0^s.025$
Corrected difference of longitude	— $7^m\ 33^s.493$
Longitude of Port Spain station	$4^h\ 6^m\ 2^s.686$
Longitude of Bridgetown station	$3^h\ 58^m\ 29^s.193$

From the center of the observatory the flag-staff at the northwest angle of Rickett's battery bore N. 67° 18′ W., distant 70.6 feet. To reduce the position of the observatory to that of the flag-staff a correction of + 0″.27 to the latitude and + 0ˢ.04 to the longitude of the station is required. Applying these corrections the result is—

Flag-staff of Rickett's battery, { Lat., N. 13° 5′ 42″.5 / Lon., W. $3^h\ 58^m\ 29^s.23$ / Or in arc, 59° 37′ 18″.45

PORT SPAIN (TRINIDAD).

The latitude of the Port Spain station, as determined from thirty-three observations of pairs of stars, is N. 10° 38′ 38″.98.

Telegraphic difference of longitude between the St. Thomas and Port Spain stations	$13^m\ 40^s.840$
Correction for personal equation, Mr. Rock being west of Lieut. Commander Green	— $0^s.025$
Corrected difference of longitude	— $13^m\ 40^s\ 815$
Longitude of St. Thomas station	$4^h\ 19^m\ 43^s.501$
Longitude of Port Spain station	$4^h\ 6^m\ 2^s.686$

From the transit-pier the flag-staff of the water-battery bore N. 81° 7′ E., distant 148 feet. To reduce the position of the station to that of the flag-staff, a correction of + 0″.23 to the latitude and — 0ˢ.123 to the longitude is required. Applying these corrections the result is—

Flag-staff of water-battery, Port Spain, { Lat., N. 10° 38′ 39″.21 / Lon., W. $4^h\ 6^m\ 2^s.56$ / Or in arc, 61° 30′ 38″.4

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